FM 5-33

FM 5-33

C2 DEPARTMENT OF THE ARMY FIELD MANUAL

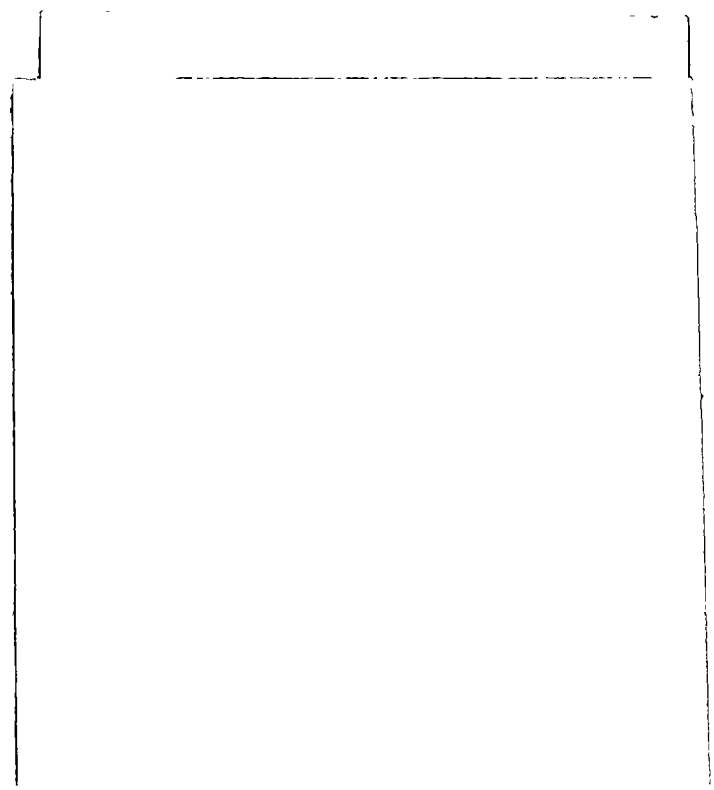
S/S by FM 5-7
Sep 1965
ch. 3 (31 Oct 1969)

ENGINEER CELLULAR TEAMS

RETURN TO ARMY LIBRARY
ROOM 1 A 518 PENTAGON

HEADQUARTERS, DEPARTMENT OF THE ARMY
OCTOBER 1967

TAGO 6011A



FIELD MANUAL
No. 5–33

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *10 October 1967*

ENGINEER CELLULAR TEAMS

		Paragraph	Page
CHAPTER 1.	INTRODUCTION		
Section I.	Purpose and scope	1–1—1–3	1–1
II.	Missions and capabilities	1–4—1–9	1–1
III.	Types of teams in a theater of operation	1–10—1–12	1–2
CHAPTER 2.	ENGINEER ADMINISTRATIVE AND HEADQUARTERS TEAMS, TOE 5–500	2–1—2–3	2–1
3.	ENGINEER FIREFIGHTING TEAMS, TOE 5–510	3–1—3–5	3–1
4.	ENGINEER EQUIPMENT OPERATING TEAMS TOE 5–520	4–1—4–12	4–1
5.	ENGINEER CONSTRUCTION, UTILITIES, AND ELECTRICAL POWER TEAMS, TOE 5–530	5–1—5–11	5–1
6.	ENGINEER TOPOGRAPHIC AND INTELLIGENCE TEAMS, TOE 5–540	6–1—6–11	6–1
7.	ENGINEER DREDGE TEAMS, TOE 5–550	7–1—7–6	7–1
8.	ENGINEER CIVIC ACTION TEAMS, TOE 5–560	8–1—8–4	8–1
9.	ENGINEER COMBAT SUPPORT TEAMS, TOE 5–570	9–1—9–4	9–1
APPENDIX A.	REFERENCES		A–1
INDEX TO TEAMS			I–1

CHAPTER 1
INTRODUCTION

Section I. PURPOSE AND SCOPE

1–1. Purpose

This manual provides guidance for commanders, staff officers, and other personnel concerned with the employment of teams of the Engineer Service Organization.

1–2. Scope

This manual covers the organization, mission, capabilities, and method of operation of the cellular teams comprising the Engineer Service Organization. When used with FM 5–1, which provides basic doctrine governing the activities of engineer troop units in a theater of operations, coverage is in sufficient detail to enable commanders and staffs to properly employ these teams in the accomplishment of their missions. The MOS of each team member is given in the team strength. Duties of members can thus be determined by reference to AR 611–101, AR 611–112, or AR 611–201. The material presented is applicable without modification to both limited and general war, either nuclear or nonnuclear; the employment of and protection from chemical, biological, and radiological agents; and to cold war.

1–3. Recommended Changes

Users of this manual are encouraged to submit recommended changes or comments to improve its clarity or accuracy. Comments should be keyed to the specific page, paragraph, and line of the text in which change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to the Commanding Officer, US Army Combat Developments Command Engineer Agency, Fort Belvoir, Virginia 22060. Originators of proposed changes which would constitute a significant modification of approved Army doctrine may send an information copy, through command channels, to the CG, USACDC, to facilitate review and follow-up.

Section II. MISSIONS AND CAPABILITIES

1–4. Mission of Engineer Cellular Teams

a. To provide engineer technical, combat support, and combat service support where units of less than company size are required.

b. To increase the productive capacity of fixed strength units where increments of less than company size are required.

c. To provide command and administrative personnel for engineer composite units.

d. To provide advisory assistance to host country forces and units in an internal defense and development operational environment.

1–5. Assignment

Teams may be attached or assigned as required to fixed strength units or may be organized into a separate composite unit.

1–6. Capabilities

a. The capabilities of an individual team are listed in the discussion of that team. The capabilities of an engineer composite unit of several teams will vary with the number and types of teams used.

b. Most of these teams must be furnished supply, mess, administrative, personnel, medi-

cal, signal, and organizational maintenance services. These are ordinarily provided by the fixed strength unit to which a team is assigned or attached. When applicable, mess teams will be drawn from the TOE 29–500 series, automotive maintenance teams from the TOE 29–510-series, and personnel services will be provided by an AG personnel service unit or a support team drawn therefrom. A composite unit formed from two or more teams may be commanded and provided administrative services by a team from TOE 5–500 (Team AB or AC).

c. These teams are not adaptable to level 2 or 3 strengths nor to a type B organization. However, host country or allied nationals may in some cases be used to supplement team strength.

d. Individuals of these teams can engage in effective coordinated defense of the team's area or installation, or contribute to the defense of the unit to which assigned or attached.

e. These teams may be sent out as mobile training teams (MTT), or may be attached singly or formed into composite units to support MAAG, Missions, or Military Assistance Commands.

f. Team commanders must be aware of their responsibilities for civil affairs civic action, and psychological operations. This is particularly true when US forces are operating in a host/guest relationship.

1–7. Basis of Allocation

The allocation of teams depends on the special support requirements. Type allocations are indicated in the discussion of individual teams.

1–8. Category

The category given each team is based on the area of employment of the units to which the team is normally assigned (reference Unit Categories, AR 320–5).

1–9. Mobility

The degree of mobility utilizing organic transport is given for each team. When teams are combined to form a composite unit, the mobility of the composite unit must be computed.

Section III. TYPES OF TEAMS IN A THEATER OF OPERATION

1–10. General

The Engineer Service Organization provides cellular, specialized teams of varying sizes, functions, and capabilities for use when standard organizations are too large or cannot meet the particular engineer needs of the theater of operations. The team organization provides variety and flexibility to permit the most efficient use of manpower and equipment. Teams may be combined to form a composite platoon or company, depending on the nature and scope of the mission. Individual teams may be attached or assigned to an engineer unit to increase the unit's capabilities, or to a unit of another arm or service such as an Area Support Command, to provide a particular, required engineer capability. Teams fall into the following eight classes:

a. Administrative and headquarters.

b. Firefighting.

c. Equipment operating.

d. Construction, utilities, and electrical power.

e. Topographic and intelligence.

f. Dredging.

g. Engineer civic action.

h. Engineer combat support.

1–11. Characteristics

Teams have the following characteristics:

a. They comprise a group of individuals trained to work together as specialists in some particular field.

b. They may perform certain operations as a unit; comprise a specialized cadre around which a larger organization is built; or act as individual inspectors, instructors, or supervisors.

c. Their equipment is generally restricted to vehicles required to transport team personnel and materiel, individual weapons, and items specifically related to their specialty.

d. Some teams consist of only a handful of specialists, while others, such as certain topographic and equipment operating teams, are small-scale replicas of corresponding larger units.

1–12. Base Camp Support in Underdeveloped Countries

In underdeveloped countries semipermanent base camps to house tactical troop units will have to be established. To support such camps composite units, consisting principally of engineer cellular teams, may be formed. Figure 1–1 shows a type composite cellular unit organized to provide support for a base camp to be occupied by approximately 5,000 tactical troops.

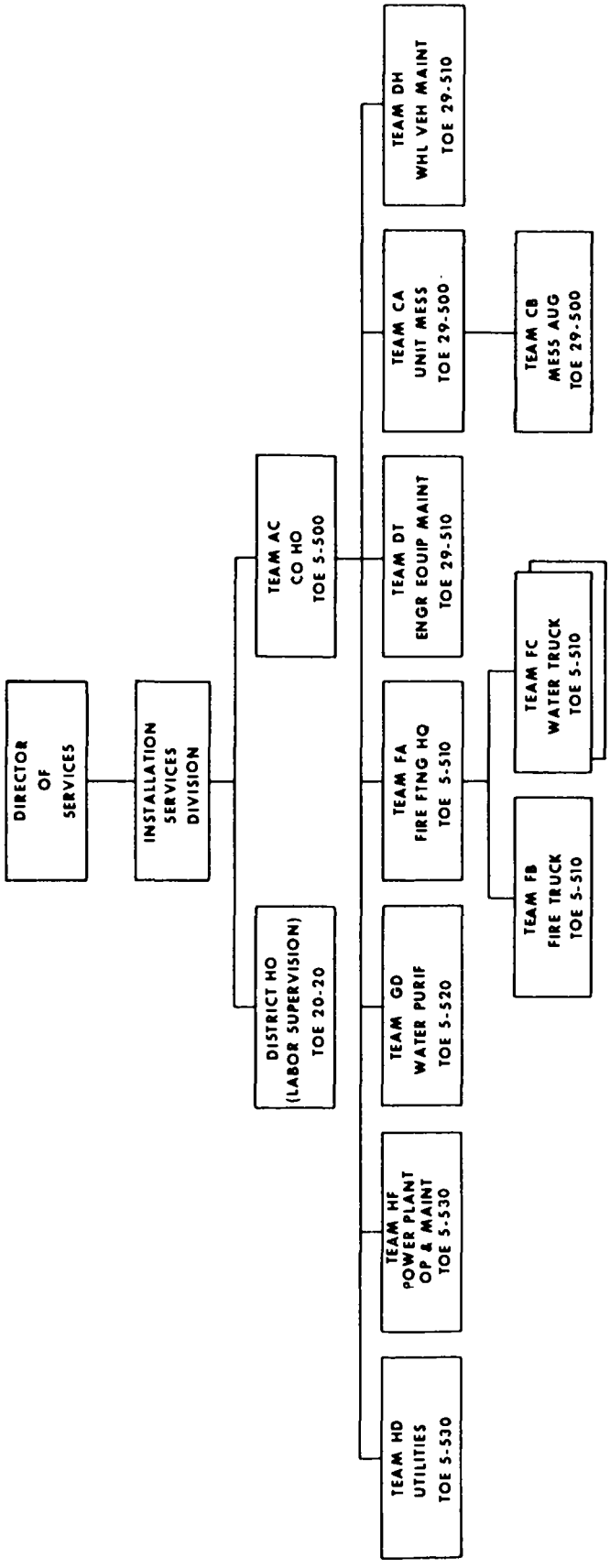


Figure 1–1. Type cellular organization for base camp support.

CHAPTER 2

ENGINEER ADMINISTRATIVE AND HEADQUARTERS TEAMS

TOE 5–500

2–1. Introduction

TOE 5–500 consists of two teams whose mission is to provide command of and administrative support for engineer composite units formed from combat support and combat service support teams of the engineer service organization. Such composite units may be attached or assigned to fixed strength field units. When so attached or assigned they may be further attached, for one or more functions, to another unit. Command relationships normally associated with attachment and assignment apply (see FM 5–1).

2–2. Team AB, Platoon Headquarters, Separate

a. Mission. To provide personnel and equipment for the headquarters of an engineer platoon formed from two or more teams of the TOE 5–500 series.

b. Capability. Capable of commanding and providing minimal administrative and logistical support for two or more TOE 5–500 series teams organized into an engineer composite unit of platoon size. The administrative and logistical support provided by this team is equivalent to that provided by the headquarters of a line platoon in a separate company or a company organic to a battalion.

c. Basis of Allocation. One per platoon, composed of TOE 5–500 series teams, with an aggregate strength of about 40 to 60.

d. Category. The category of this team depends on the category of the composite unit which it commands and is based on the mission, composition, and area of employment of the command to which the composite unit is assigned or attached.

e. Mobility. 100 percent mobile. The mobility of the composite unit commanded by the team depends on the mobility of the teams which compose it.

f. Strength. Aggregate—4, as follows:

Number	*Grade*	*MOS*
1	LT	1320
1	E–7 (NCO)	51H40
1	E–4	71H20
1	E–4	76K20

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Truck, cargo, ¾-T 1

Other equipment

Tool kit, armorer's 1

h. Method of Operation. Team functions as the headquarters for a platoon formed from two or more other teams. For example, two gas generating teams (GF), operating at a single location or close to each other, might be placed under this team's command.

2–3. Team AC, Company Headquarters

a. Mission. To provide personnel and equipment for the headquarters of a company-size unit formed from two or more teams of the TOE 5–500 series.

b. Capability. Capable of commanding and providing minimal administrative and logistical support for two or more TOE 5–500 series teams organized into an engineer composite unit of company size. The administrative and logistical support provided by this team is equivalent to that provided by the headquarters of a line company organic to a battalion, less mess and communications.

c. Basis of Allocation. One per engineer composite unit, formed from TOE 5–500 series teams, organized into two or more platoons, and with an aggregate strength of about 80 to 120.

d. Category. I, II, or III. See paragraph 2–1*d*.

e. Mobility. 100 percent mobile. The mobility of the composite unit commanded by the team depends on the mobility of the teams which compose it.

f. Strength. Aggregate—8, as follows:

Number	*Grade*	*MOS*
1	CPT	1328
1	LT	1328
1	E–8 (NCO)	51H50
1	E–6 (NCO)	76K40
2	E–4	71H20
1	E–4	76C20
1	E–3	71A10

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Trailer, cargo, ¾-T ---------- 1
Trailer, cargo, 1½-T ---------- 1
Truck, cargo, ¾-T ---------- 1
Truck, cargo, 2½-T ---------- 1

Other equipment

Telephone set, TA–312/PT ---------- 1
Tool kit, carpenter's ---------- 1

h. Method of Operation. Team functions as the headquarters for a company formed from two or more other teams. Subordinate teams are organized into two or more platoons and in some cases may have as a command element a team AB. A composite unit could be organized under this team's command consisting of one or two teams GI, Concrete Mixing and Paving, and one team GH, Quarrying and Rock Processing. Such a composite unit could be engaged in a large concrete preducing operation with team GH providing the aggregate for team(s) GI.

CHAPTER 3

ENGINEER FIREFIGHTING TEAMS

TOE 5–510

3–1. Introduction

a. General. TOE 5–510 consists of four teams of various sizes and types, whose mission is to provide specialized personnel and equipment for firefighting service support as required.

b. References. For information on fire protection in the theater of operations see TM 5–315.

3–2. Team FA, Firefighting Headquarters

a. Mission. To provide personnel and equipment to serve as a command element for an engineer firefighting composite unit.

b. Capability. Capable of planning and organizing an area or installation fire prevention and firefighting program, and commanding and controlling assigned or attached firefighting teams.

c. Basis of Allocation. One per two to four firefighting teams (FB and FD) and one water truck team (FC).

d. Category. II.

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—4, as follows:

Number	*Grade*	*MOS*
1	LT	9414
1	E–[illegible] (NCO)	51M40
1	E–6 (NCO)	51M40
1	E–3	71A10

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Trailer, cargo, ¼-T 1
Truck, cargo, ¾-T 1
Truck, utility, ¼-T 1

Other equipment

Blanket, fire, wool, w/grommets and rope handle 2
Extinguisher, fire, carbon dioxide, 15-lb 2
Extinguisher, fire, vaporizing liquid, 1 gal 2
Extinguisher, fire, foam, 2½ gal 2
Firefighting equipment set, repair of extinguishers and fire hose 1
Light, warning, vehicular, red, w/blinker device 2
Repair and refill kit, carbon dioxide fire extinguisher 1
Siren, electric motor operated 2
Telephone set, TA–312/PT 1

h. Method of Operation. Team leader serves as the fire marshal of the installation or area of responsibility. Team members conduct fire prevention inspections and train volunteer personnel in firefighting operations. In addition to planning for overall fire defense and commanding firefighting teams, this team maintains and refills fire extinguishers and makes minor repairs to fire hose.

3–3. Team FB, Fire Truck

a. Mission. To provide personnel and equipment for firefighting operations.

b. Capability. Capable of providing fire protection, administration of timely and adequate first aid, and implementing a fire prevention program for an installation housing 5,000 to 10,000 troops, or a warehouse and open storage area of 100,000 square feet. Also capable of radiological decontamination of the exterior and roofs of warehouses and other structures by firehosing.

c. Basis of Allocation. One per installation housing 5,000 to 10,000 troops, or containing 100,000 square feet of warehouse and open storage.

d. Category. II.

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—6, as follows:

Number	*Grade*	*MOS*
1	E–5 (NCO)	51M40
1	E–4 (NCO)	51M20
3	E–4	51M20
1	E–3	51M20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Firefighting equipment set, truck mounted, structural type, overseas, class 530 B ---------1

Other equipment

Blanket, fire, wool, w/grommets and rope handle ---------2

h. Method of Operation. Team members provide fire protection for the team's assigned installation or area by conducting fire prevention inspections and by fighting fires. See TM 5–525 for detailed information on radiological decontamination of structures by firehosing.

3–4. Team FC, Water Truck

a. Mission. To provide personnel and equipment for the transport of water for firefighting purposes.

b. Capability. Capable of transporting 1,000 gallons of water per trip.

c. Basis of Allocation. One or more per firefighting headquarters (Team FA) as required.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—2, as follows:

Number	*Grade*	*MOS*
1	E–4	51M20
1	E–3	51M20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Truck, tank, water, 2½-T ---------1

Other equipment

No other major items.

h. Method of Operation. Team transports water for firefighting when sufficient water is not available. Team members may be used as fire fighters.

3–5. Team FD, Brush Fire Truck

a. Mission. To provide equipment and supervisory and training personnel for brush fire fighting.

b. Capability. Capable of furnishing protection against grass or brush fires within its assigned area of responsibility when augmented with personnel and additional handtools.

c. Basis of Allocation. One per installation housing 5,000 to 10,000 troops, or containing 100,000 square feet of warehouse and open storage.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—2, as follows:

Number	*Grade*	*MOS*
1	E–5 (NCO)	51M40
1	E–3	51M20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Firefighting equipment set, truck mounted, brush type, overseas, class 530 B ---------1

Other equipment

No other major items.

h. Method of Operation. Team members train personnel of the supported unit in brush firefighting and supervise them when so engaged. Additional handtools (axes, mattocks, brush hooks) must be provided by the supported unit.

CHAPTER 4

ENGINEER EQUIPMENT OPERATING TEAMS

TOE 5-520

4-1. Introduction

TOE 5-520 consists of eleven teams of various sizes and types, whose mission is to provide engineer equipment operating support to the army as required. Engineer equipment operating teams may be attached to, or operate with engineer civic action teams to augment their capability in such specialties as well-digging, forestry, and road construction.

4-2. Team GA, Forestry

a. Mission. To provide personnel and equipment for the conduct of logging and sawmill operations to produce rough lumber and timber piling.

b. Capability. Capable of producing 10,000 to 15,000 board feet of rough lumber and timber piling per day.

c. Basis of Allocation. Normally attached to a supply and service battalion of a general support group or to an engineer construction group.

d. Category. II

e. Mobility. Fifty percent mobile.

f. Strength. Aggregate—44, as follows:

Number	*Grade*	*MOS*
1	LT	4942
1	E-7 (NCO)	57D40
2	E-6 (NCO)	57D40
2	E-5	57D20
1	E-5	62E20
1	E-4	62E20
1	E-4	44D20
1	E-4	62F20
1	E-4	62B20
1	E-4	76C20
2	E-4	64B20
10	E-4	57D20
2	E-3	64A10
18	E-3	57A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Semitrailer, low bed, 25-T ---- 1
Truck, cargo, ¾-T ---- 1
Truck, cargo, 2½-T ---- 1
Truck, tractor, 10-T ---- 2

Other equipment

Blade, circular saw, 42-in. for use with walking tractor ---- 2
Chain saw attachment for walking tractor, 36-in ---- 1
Chain saw, 18-in., GED ---- 3
Crane-shovel, crawler mtd, 10-T, ¾ cu yd ---- 1
Logging arch, tractor, med ---- 1
Logging equipment set, trk mtd ---- 1
Pneumatic tool and compressor outfit, 250 cfm, trlr mtd ---- 1
Sawmill, circular, semitrlr mtd, 60-in. blade, DED ---- 1
Supplementary equipment, forestry company ---- 1
Telephone set, TA-312/PT ---- 1
Tool kit, blacksmith's ---- 1
Tractor, full tracked, DED, and DBP ---- 1
Tractor, walking, whl mtd, 20 HP ---- 1

h. Method of Operation. Team personnel select areas from which to cut timber and a suitable site for establishing the sawmill. The team leader supervises the team operations, administration, and training. The logging supervisor coordinates the logging and sawmill operations and acts as first sergeant. The team is informally divided into two sections; the logging and hauling section, supervised by the logging foreman, and the milling and yard section, supervised by the sawmill foreman, who is also the sawyer. The logging and hauling section is responsible for the reduction of standing timber and the movement of the logs to the sawmill site. The milling and yard section is responsible for the stockpiling of logs, the

milling of logs, and the grading, stocking, and shipping of milled lumber and piling. Wire communication between the supported unit and the team is supplied by the supported unit. For detailed information on logging and sawmill operations see TM 5–342.

4–3. Team GB, Well Drilling

a. Mission. To provide personnel and equipment for drilling water wells. As a secondary mission, may drill large blast holes for quarrying or to create obstacles.

b. Capability. Depending on the type of drilling equipment issued, drills wells of various diameters to a maximum depth of 1,500 feet. Installs casings, screens, and pumps to supply water to users at the well head.

c. Basis of Allocation. Normally attached to an engineer construction or combat unit to provide support for drilling operations.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—2, as follows:

Number	*Grade*	*MOS*
2	E–5	62G20

g. Major Items of Equipment

Weapons

Individual weapons only.

Vehicles

Trailer, low bed, 8-T ---------- 1
Truck, flat bed, 5-T ---------- 1

Other equipment

Drilling machine, percussion, skid mtd, GED, 6 in. dia. hole at 1,000 ft depth ---------- 1
or—
Drilling machine, rotary, skid mtd, GED, 5⅞ in. hole at 1,500 ft depth ---------- 1
Tool kit, pipefitter's ---------- 1

h. Method of Operation. Team personnel reconnoiter an area and select one or more well sites. Each of the team members heads up a shift so that the well drilling operation is continuous. The supported unit provides one or more helpers for each shift and must supply all casings, screens, and pumps required. Engineer work at the well site—clearing, access roads, and a parking area—is performed by the supported unit. For detailed information on well drilling operations see TM 5–297.

4–4. Team GC, Water Purification

a. Mission. To provide personnel and equipment for purifying and storing water.

b. Capability. Capable of producing up to 3,000 gallons of potable water per hour and storing 9,000 gallons.

c. Basis of Allocation. Normally attached to an engineer unit having a large water supply mission or an area support group.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—4, as follows:

Number	*Grade*	*MOS*
1	E–4 (NCO)	51N40
1	E–4	51N20
1	E–3	51N20
1	E–3	51A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Truck, cargo, ¾-T ---------- 1

Other equipment

Generator set, 10 kw ---------- 1
Telephone set, TA–312/PT ---------- 1
Water purification equipment set, trk mtd, 3,000 gph ---------- 1
Water quality control set ---------- 1

h. Method of Operation. Team personnel reconnoiter for and select a suitable site for the establishment of a water point. Engineer work at the water point—clearing, access roads, turn-arounds, and a parking area—is performed by the supported unit. Wire communication to the water point, when necessary, is installed by the supported unit. Security of the water point beyond the capability of the team is provided by the supported unit. For details of water purification operations, including the treatment of water contaminated with chemical, biological, and radiological (CBR) agents, see TM 5–700.

4–5. Team GD, Water Purification (Central Plant)

a. Mission. To provide personnel and equipment for the establishment and operation of a central field water plant.

b. Capability. Capable of operating single or

multiple standard water purification units forming a central field water plant to support 6,000 to 60,000 individuals.

c. Basis of Allocation. Normally attached to an engineer unit, such as a brigade or group, which has a large water supply mission or an area support group. May be attached to a military government team.

d. Category. III

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—12, as follows:

Number	Grade	MOS
1	LT	4940
1	E–5 (NCO)	51N40
1	E–4(NCO)	51N40
2	E–4	51K20
2	E–4	51N20
2	E–3	51N20
1	E–3	64A10
2	E–2	51A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¾-T ----------1
Truck, cargo, ¾-T ----------1

Other equipment

Generator set 1.5 kw ----------1
Generator set 10 kw ----------4
Light set, general illuminating, 25 outlet ----------1
Telephone set, TA-312/PT ----------4
Tool kit, pipefitter's ----------1
Water purification equipment set, trk mtd, 3,000 gph ----------4
Water quality control set ----------4

h. Method of Operation. Team personnel reconnoiter for and select a suitable site for the establishment of a central field water plant. Individual water purification units (up to four) are connected to a single central distribution point. Engineer work at the water point is performed by the supported unit. Wire communication to the water point, when necessary, is installed by the supported unit. Security of the water point beyond the capability of the team is provided by the supported unit. For details of water purification operations, including the treatment of water contaminated with CBR agents, see TM 5–700.

4–6. Team GE, Water Transport

a. Mission. Provides personnel and equipment for short hauls of 10 to 15 miles to transport water in bulk.

b. Capability. Capable of transporting 5,000 gallons of water in one trip.

c. Basis of Allocation. Normally attached to an engineer unit or an area support group with a water hauling requirement.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—8, as follows:

Number	Grade	MOS
1	E–4	64A10
4	E–3	64A10
3	E–2	64A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Truck, tank, water, 2½-T ----------5

h. Method of Operation. Team hauls potable water from a water source to a distribution point or non-potable water to support a large concrete construction project.

4–7. Team GF, Gas Generating

a. Mission. To provide personnel and equipment for the production of acetylene, oxygen, and nitrogen.

b. Capability. Capable of producing 750 cu ft of acetylene, 2,000 cu ft of oxygen, and 400 cu ft of nitrogen per hour of operation, and storing limited quantities of these gases.

c. Basis of Allocation. Normally one per functionalized depot.

d. Category. III

e. Mobility. 15 percent mobile.

f. Strength. Aggregate—27, as follows:

Number	Grade	MOS
1	LT	4944
1	E–5 (NCO)	53B40
1	E–5	62B30
1	E–4	52B30
11	E–4	53B20
1	E–4	51L20
11	E–3	53B20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Chassis, trailer, generator, 2½-T	1
Trailer, low bed, 8-T	4
Truck, cargo, 2½-T	1
Truck, tractor, 5-T	1

Other equipment

Cylinder, compressed gas, acetylene, 225 cu ft	250
Cylinder, compressed gas, oxygen, 240 cu ft	500
Cylinder, compressed gas, nitrogen, 200 cu ft	250
Generator and charging plant, oxygen-nitrogen, semitrlr mtd, electric driven, 1,000 cu ft oxygen, 200 cu ft nitrogen per hr	2
Generator set, 15 kw	1
Generator and charging plant, acetylene, semitrlr mtd, 750 cu ft per hr	1
Generator set, 100 kw	4
Tool kit, pipefitters's	8
Tool kit, service, refrigeration	1

h. Method of Operation. Team personnel operate and maintain equipment to produce gases for issue by depot to which attached. Issue is normally made on the basis of exchanging full cylinders for empty ones turned in by the using unit. For details on gas generating see TM 5–351.

4–8. Team GG, Carbon Dioxide Generating

a. Mission. To provide personnel and equipment for the generation, storage, and transport of carbon dioxide in gaseous liquid, or solid (dry ice) state.

b. Capability. Capable of producing 300 pounds of liquid carbon dioxide per hour of operation; conversion of 260 pounds to dry ice per hour of operation; and storage of 8 tons of liquid carbon dioxide.

c. Basis of Allocation. Normally one per functionalized depot.

d. Category. III

e. Mobility. 44 percent mobile.

f. Strength. Aggregate—13, as follows:

Number	*Grade*	*MOS*
1	LT	4944
1	E–5 (NCO)	53C40
1	E–5	62B30
5	E–4	53C20
1	E–4	51L20
4	E–3	53C20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Chassis, trailer, general purpose 3½-T	2
Truck, cargo, 2½-T	2
Truck, tractor, 5-T	1
Truck, tractor, 10-T	1

Other equipment

Conversion and storage unit, carbon dioxide, semitrlr mtd, 16,000 lb capacity	1
Conversion unit, carbon dioxide, semitrlr mtd, 260 lb per hr	1
Cooling tower, liquid, semitrlr mtd, 240 gpm	1
Cylinder, compressed gas, carbon dioxide	250
Generating and charging plant, dioxide, semitrlr mtd, 300 lb per hr	1
Generator set, 60 kw	2
Tank fabric, collapsible, 3000 gal	1
Tank, shipping and storage, dry ice, 1–T	6
Tool kit, pipefitter's	1
Tool kit, service, refrigeration	1

h. Method of Operation. Team personnel operate and maintain equipment to produce carbon dioxide for issue by depot to which attended. Issue is normally made on the basis of exchanging full cylinders for empty ones turned in by the using unit. For details on carbon dioxide generation see TM 5–351.

4–9. Team GH, Quarrying and Rock Processing

a. Mission. To provide personnel and equipment for quarrying, crushing, screening, and washing rock.

b. Capability. Capable of operating a rock quarry or gravel pit to furnish raw material for the crushing, screening, and washing plant. Capable of producing processed material (crushed rock or gravel) in varying quantities depending on desired gradation and on other processing required (washing and sand dehydration). Capable of single shift operation in quarrying and rock crushing.

c. Basis of Allocation. Normally attached to an engineer construction group as required.

d. Category. III

e. Mobility. 23 percent mobile.

f. Strength. Aggregate—54, as follows:

Number	*Grade*	*MOS*
1	LT	1328
1	E–7 (NCO)	62G50
1	E–6 (NCO)	62G40
1	E–5 (NCO	62G40
4	E–5	62F20
6	E–5	62E20
1	E–5	62B20

Number	Grade	MOS
5	E–5	62G20
2	E–4	62E20
3	E–4	62B20
4	E–4	64B20
20	E–4	62G20
2	E–4	52B30
1	E–3	62A10
2	E–3	12A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Semitrailer, low bed, 25-T ---2
Trailer, low bed, 8-T ---2
Truck, cargo, ¾-T ---1
Truck, cargo, 2½-T ---2
Truck, dump, 5-T ---2
Truck, tractor, 10-T ---2

Other equipment

Ball, wrecking, 3-T ---1
Bin, storage, aggregate, 1 compartment, 60-T ---3
Boom, crane, 50 ft, 40-T ---1
Boom, extension, middle, 10 ft, 40-T ---1
Bucket, clamshell, 2 cu yd ---1
Compressor, rotary, wheel mtd, 600cfm, 100 psi ---3
Crane shovel, crawler mtd, 40-T, 2 cu yd ---2
Crushing, screening, and washing plant, wheel mounted, 225-T per hour ---1
Floodlight set, elec, portable ---4
Generator set, 5 kw ---4
Generator set, 100 kw ---1
Loader, scoop, 2½ cu yd ---1
Rock drilling equipment ---3
Shop equipment, truck mtd ---1
Shovel front, 2 cu yd ---1
Tractor, full tracked, w/buldozer, medium DBP ---2

h. Method of Operation. Team operates existing quarries or gravel pits or opens up and operates new ones at suitable sites. Team sets up and operates the crushing, screening, and washing plant and produces aggregate of predetermined gradation and cleanliness. Team loads aggregate into trucks of using unit(s). For details of quarrying and crushing operations see TM 5–331 and TM 5–332.

4–10. Team GI, Engineer Concrete Mixing and Paving

a. Mission. To provide personnel and equipment for the production of large quantities of concrete and for placing concrete pavement.

b. Capability. Capable of producing up to 75 cubic yards of concrete per hour of operation at an on-site paving job or as a central mix plant. The supported unit must provide sufficient dump trucks and drivers to supply the paver. Capable of placing, finishing, and curing up to 335 square yards of rigid pavement, 8 inches thick, from 20 to 25 feet wide, per hour of operation.

c. Basis of Allocation. Normally attached to an engineer construction group as required.

d. Category. III

e. Mobility. Thirty percent mobile.

f. Strength. Aggregate—28, as follows:

Number	Grade	MOS
1	LT	1328
2	E–6 (NCO)	62D40
1	E–5	62F30
6	E–5	62D20
6	E–4	62D20
2	E–4	64B20
1	E–4	63B20
7	E–3	62A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Semitrailer, low bed, 60-T ---1
Semitrailer, tank, water, 2,000 gal, w/heater ---2
Truck, cargo, ¾-T ---1
Truck, cargo, 2½-T ---2
Truck, tractor, 5-T ---2
Truck, tractor, 10-T ---1
Truck, utility, ¼-T ---1

Other equipment

Batching plant, aggregate, 3-compartment, 100-T bin ---1
Batching plant, cement, 1-compartment, 84.6-T bin, 50-T per hour ---1
Boom, crane, 30 ft ---1
Boom, extension, middle, crane ---2
Bucket, clamshell, ¾ cu yd ---1
Crane-shovel, trk mtd, 20-T, ¾ cu yd ---1
Curing machine, concrete, gas driven, 20-ft wide, w/pump ---1
Finishing machine, concrete, paving, longitudinal, 20-ft wide ---2
Float, bridge, concrete finishing, 13 to 21 ft wheel base, 20 to 25 ft span ---2
Floodlight set, electric, portable, 6 floodlights, 5 kw ---2
Form, concrete paving, 10 ft x 8 in x 8 in ---500
Generator set, 5 kw ---2
Heater, concrete mixer, hot water 800 gph ---2
Paver, concrete, crawler mtd, dual drum, 34 cu ft ---1
Pump, centrifugal, gas driven, frame mounted, 2-in, 170 gpm, 50-ft head ---1

Other equipment

Saw, abrasive disk, masonry, gas driven, 18-in blade ---------- 2
Spreader, concrete, 25-ft span ---------- 1
Test set, concrete ---------- 1
Tank unit, liquid dispensing, for trailer mounting, aluminum tank ---------- 2
Tool kit, mason and concrete finishers ---------- 3

h. Method of Operation. Team operates concrete mixing and paving equipment in support of a unit engaged in large scale concrete paving operations. Supported unit provides dump trucks and drivers to haul from batch plant to paver and from source of aggregates and cement to batch plant. Team can provide operators for two shifts. For details of concrete paving operations see TM 5–331 and TM 5–337.

4–11. Team GJ, Well Drilling (Airborne)

a. Mission. To provide airborne personnel and air droppable equipment for drilling and developing water wells. As a secondary mission may drill large blast holes for quarrying or to create obstacles.

b. Capability. Capable of drilling holes 4⅞ inch diameter 600 feet deep; 5⅞ inch diameter, 300 feet deep; 7⅞ inch diameter 150 feet deep. Installs casings, screens, and pumps, and develops wells to supply water to users at the well head.

c. Basis of Allocation. Normally attached to an engineer combat battalion, airborne, or to the airborne division engineer battalion. May be attached to the engineer light equipment company, airborne.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—2, as follows

Number	*Grade*	*MOS*
2	E–5	62G20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, low bed, 8-T ---------- 1
Truck, flat bed, 5-T ---------- 1

Other equipment

Drilling machine, rotary, skid mtd, GED, 4⅞ inch diameter hole at 600 foot depth ---------- 1
Tool kit, pipefitter's ---------- 1
Torch outfit, cutting and welding ---------- 1

h. Method of Operation. Each of the team members heads up a shift so that the well drilling operation is continuous. The supported unit provides one or more helpers for each shift. If the team and its drilling equipment are air dropped, the supported unit provides equipment to move the drill rig to the drilling site. Engineer work at the well site—clearing, access roads, and a parking area—is performed by the supported unit. For detailed information on well drilling operations see TM 5–297.

4–12. Team GK, Water Distillation

a. Mission. To provide personnel and equipment for the production of potable water by distillation of sea or brackish water.

b. Capability. Capable of producing 6,000 gallons of potable water per day, operating on a two shift basis; has a storage capacity of 3,000 gallons.

c. Basis of Allocation. May be attached to any size unit or assigned to a civic action mission on an as required basis.

d. Category. III.

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—5, as follows:

Number	*Grade*	*MOS*
1	E–4 (NCO)	51N40
1	E–4	51N20
2	E–3	51N20
1	E–2	51A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Truck, cargo, 2½-T ---------- 2

Other equipment

Distillation equipment set, water, thermo-compression, trlr mtd 150 GPH ---------- 2
Water quality control set ---------- 2

h. Method of Operation. Team personnel reconnoiter for and select a suitable site for a water point, Engineer work at the water point; clearing, access roads, turnarounds, brine sumps, and a parking area is performed by the supported unit. For information on water distillation and on the treatment of water contaminated with CBR agents see TM 5–700.

CHAPTER 5

ENGINEER CONSTRUCTION, UTILITIES, AND ELECTRICAL POWER TEAMS, TOE 5–530

5–1. Introduction

TOE 5–530 consists of ten teams of various sizes and types, whose mission is to provide, as required, specialized personnel and equipment for the installation and maintenance of utilities and for certain types of construction.

5–2. Team HA, Diving

a. Mission. To provide personnel and equipment for shallow and deep water diving in support of port construction and rehabilitation, and submarine pipeline construction.

b. Capability. Capable of performing construction operations underwater, such as welding, demolitions, and obstacle removal, in depths down to 120 feet.

c. Basis of Allocation. Normally one per engineer construction group engaged in major port or submarine pipeline projects.

d. Category. III

e. Mobility. Forty percent mobile.

f. Strength. Aggregate—10, as follows:

Number	*Grade*	*MOS*
1	LT	7242
1	E–7 (NCO)	00B40
2	E–6	00B30
2	E–5	00B30
2	E–4	00B30
2	E–3	00B10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¾-T ---------- 1
Trailer, cargo, 1½-T ---------- 1
Truck, cargo, ¾-T ---------- 1
Truck, cargo, 2½-T ---------- 1

Other equipment

Chamber, recompression, diver's, 100 psi ---------- 1
Compressed air facility ---------- 1
Compressor, reciprocating, GED, skid mtd, 55 cfm, 100 psi ---------- 1
Compressor, reciprocating, GED, wheel mtd, 15 cfm, 3500 psi ---------- 1
Detector, multi-gas detector, pump model, w/detector tubes ---------- 1
Diving equipment set, 2 person, 120 foot depth ---- 2
Diving equipment set, 2 person, 100 foot depth ---- 2
Diving equipment set, 1 person, open circuit ---- 4
Repair kit, diving equipment ---------- 1
Repair kit for UDT type life jacket ---------- 1
Resuscitator, military model ---------- 1
Special tools, diver's ---------- 2
Stage, decompression, diver's ---------- 2

h. Method of Operation. Team provides personnel and equipment for underwater operations. Supported unit provides tools such as underwater cutting and welding sets, demolition materials, and, if required, watercraft from which to operate. For information on diving see TM 55–375.

5–3. Team HB, Welding

a. Mission. To provide qualified welders and welding equipment for support of units with welding requirements which cannot be met with organic resources.

b. Capability. Capable of performing electric arc, including inert gas shielded, and oxy-acetylene welding.

c. Basis of Allocation. Normally to an engineer construction brigade or group or to a functionalized general support group.

d. Category. III

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—4, as follows:

Number	*Grade*	*MOS*
1	E–5	44C20
2	E–4	44C20
1	E–3	44A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Truck, cargo, 2½-T ----------2

Other equipment

Tool kit, welder's ----------2
Torch outfit, cutting and welding set No. 3 -----2
Welding set, arc, inert gas shielded ----------2
Welding shop, trlr mtd, 300 amp ----------2

h. Method of Operation. Team furnishes all types of welding to supported unit. For details on welding theory and practice see TM 9–237.

5–4. Team HC, Utilities

a. Mission. To provide personnel and equipment for utilities maintenance at overseas installations.

b. Capability. Capable of providing post engineer type services for an overseas or theater of operations installation with a population up to 2,500. Maintains and repairs buildings, roads, and utilities including refrigeration.

c. Basis of Allocation. Normally one per overseas camp, base, depot, support group, or other installation with a population up to 2,500.

d. Category. III

e. Mobility. 95 percent mobile.

f. Strength. Aggregate—35, as follows:

Number	*Grade*	*MOS*
1	CPT	7130
2	E–6 (NCO)	51P40
1	E–5	82B20
1	E–5	62E30
1	E–5	52G20
1	E–5	62E20
1	E–5	51B20
1	E–5	51K20
2	E–4	62E20
1	E–4	44D20
3	E–4	51B20
3	E–4	52F20
2	E–4	62B20
1	E–4	76C20
1	E–4	81A10
2	E–4	64B20
3	E–4	51K20
1	E–4	51L20
1	E–4	44C20
1	E–4	63B20
3	E–3	51A10
2	E–3	56B20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¼-T ----------1
Truck, cargo, ¾-T ----------3
Truck, dump 5-T ----------2
Truck, utility, ¼-T ----------1

Other equipment

Drafting equipment set, bn ----------1
Fork lift, GED, 6,000 lb ----------1
Generator set, 3 kw ----------1
Grader, road, mtzd, DED, 6 x 4 ----------1
Loader, scoop, 2½ cu yd ----------1
Pneumatic tool and compressor outfit, 250 cfm, trailer mtd ----------1
Pump, centrifugal, pneumatic driven, 25 ft hd, 210 gpm ----------2
Rod, level ----------1
Rod, stadia ----------1
Roller, motorized, GED, 3-wheel, 10-T ----------1
Spray outfit, paint, 2 guns, w/compressor ------1
Tool kit, blacksmith's ----------1
Tool kit, carpenter's ----------4
Tool kit, electrician's, set No. 1 ----------3
Tool kit, pioneer, engineer platoon ----------1
Tool kit, pipefitter's, ⅛ to 2 in pipe ----------1
Tool kit, pipefitter's, 2½ to 4 in pipe ----------1
Tool kit, service, refrigeration ----------1
Tool kit, sheet metal worker's ----------1
Tool kit, welder's ----------1
Tool outfit, pioneer, portable electric tools ------1
Transit, 1 minute 16 to 21 diam. magnifying power ----------1
Tripod, survey ----------1
Welding shop, trlr mtd, 300 amp ----------1
Welding set, arc, inert gas shielded ----------1

h. Method of Operation. Team functions in a manner similar to that of a post engineer organization at a CONUS installation. The team leader acts as the post engineer; team members repair and maintain utilities services, structures, and roads, and do minor new construction within the team's capability. For details on repairs and utilities see the TM 5–600 series.

5–5. Team HD, Utilities

a. Mission. To provide personnel and equipment for utilities maintenance at overseas installations.

b. Capability. Capable of providing post engineer type services for an overseas or theater of operations installation with a population of 2,500 to 4,000. Maintains and repairs buildings, roads, and utilities, including refrigeration.

c. Basis of Allocation. Normally one per overseas camp, base, depot, support group/ brigade, or other installation with a population of 2,500 to 4,000.

d. Category. III

e. Mobility. 95 percent mobile.

f. Strength. Aggregate—55, as follows:

Number	*Grade*	*MOS*
1	CPT	7130
1	WO	521A
1	E–7 (NCO)	51P40
1	E–6 (NCO)	51H40
1	E–6 (NCO)	51P40
1	E–5	82B20
1	E–5	62E30
1	E–5	52G20
1	E–5	62E20
2	E–5	51B20
1	E–5	52F20
1	E–5	51K20
2	E–4	62E20
1	E–4	44D20
8	E–4	51B20
3	E–4	52F20
1	E–4	62B20
1	E–4	76C20
1	E–4	81A10
3	E–4	51J30
3	E–4	64B20
4	E–4	51K20
2	E–4	51L20
3	E–4	51J20
1	E–4	44C20
1	E–4	63B20
4	E–3	51A10
1	E–3	52A10
2	E–3	56B20
1	E–3	71A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¼-T ---1
Trailer, cargo, ¾-T ---2
Truck, cargo, ¾-T ---3
Truck, dump, 5-T ---3
Truck, utility, ¼-T ---1

Other equipment

Drafting equipment set, bn ---1
Fork lift, GED, 6,000 lb ---1
Generator set, 3 kw ---1
Grader, road, mtzd, DED, 6 x 4 ---1
Loader, scoop, 2½ cu yd ---1
Pneumatic tool and compressor outfit, 250 cfm, trlr mtd ---1
Pump, centrifugal, GED, frame mtd, 170 gpm, 50 ft head ---1
Rod, level ---1
Rod, stadia ---1
Roller, motorized, GED, 3-wheel, 10-T ---1
Spray outfit, paint, 2 guns, w/compressor ---1
Tool kit, blacksmith's ---1
Tool kit, carpenter's ---10
Tool kit, electrician's, set No. 1 ---4
Tool kit pioneer, engineer platoon ---2
Tool kit, pipefitter's, ⅛ to 2 in pipe ---4
Tool kit, pipefitter's, 2½ to 4 in pipe ---1
Tool kit, service, refrigeration ---1
Tool kit, sheet metal worker's ---3
Tool kit, welder's ---1
Tool outfit, pioneer, portable electric tools ---1
Torch outfit, cutting and welding, set No. 3 ---1
Transit, 1 minute, 16 to 21 diam. magnifying power ---1
Tripod, survey ---1
Welding set, arc, inert gas shielded ---1
Welding shop, trlr mtd, 300 amp ---1

h. Method of Operation. Team functions in a manner similar to that of a post engineer organization at a CONUS installation. The team leader acts as the post engineer; team members repair and maintain utilities services, structures, and roads, and do minor new construction within the team's capability. For details on repairs and utilities see the TM 5–600-series.

5–6. Team HJ, Utilities

a. Mission. To provide personnel and equipment for utilities maintenance at overseas installations.

b. Capability. Capable of providing post engineer type services for an overseas or theater of operations installation with a population up to 10,000. Maintains and repairs buildings, roads, and utilities, including refrigeration.

c. Basis of Allocation. Normally one per overseas camp, base, depot, area support group (ASCOM), support group (FASCOM), or other installation with a population of 8,000 to 10,000.

d. Category. III.

e. Mobility. 90 percent mobile.

f. Strength. Aggregate—103, as follows:

Number	*Grade*	*MOS*
1	LTC	7130
1	CPT	7130
1	LT	7020
1	WO	521A

Number	Grade	MOS
1	E–8 (NCO)	51H50
1	E–7 (NCO)	51H40
1	E–7 (NCO)	51P40
1	E–6 (NCO)	51P40
1	E–6 (NCO)	62B40
1	E–6 (NCO)	76K40
1	E–6	81B20
2	E–5	62D20
1	E–5	82B20
4	E–5	62E30
1	E–5	44E20
1	E–5	56B20
2	E–5	52D20
1	E–5	91S20
1	E–5	52F20
1	E–5	62B20
2	E–5	51B20
2	E–5	51K20
1	E–5	44C20
3	E–5	62E20
1	E–5	51N40
5	E–4	62E20
2	E–4	62D20
2	E–4	71B30
8	E–4	51B20
1	E–4	62F20
6	E–4	52F20
1	E–4	81A10
4	E–4	62B20
1	E–4	76C20
1	E–4	51J30
4	E–4	64B20
2	E–4	51D20
7	E–4	51K20
2	E–4	51L20
1	E–4	51J20
1	E–4	44C20
2	E–4	63B20
2	E–3	62D20
2	E–3	64B20
10	E–3	51A10
1	E–3	52A10
1	E–3	62A10
1	E–3	56B20
1	E–3	71A10
1	E–3	63A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Semitrailer, low bed, 25-T ---------- 1
Trailer, cargo, 1½-T ---------- 1
Trailer, tank, water, 400 gal ---------- 1
Truck, cargo, ¾-T ---------- 6
Truck, cargo, 2½-T ---------- 2
Truck, dump, 5-T ---------- 6
Truck, tractor, 5-T ---------- 1
Truck, tractor, 10-T ---------- 1
Truck, utility, ¼-T ---------- 3

Other equipment

Book set, construction group ---------- 1
Cabinet, tool and spare parts ---------- 2
Crane, wheel mounted, 5-T, ⅜ cu yd ---------- 1
Distributor, bituminous material, truck mounted, 800 gal ---------- 1
Distributor, water, truck mounted, 1,000 gal ---- 1
Drafting equipment set, bn, charts sketches, and overlays ---------- 2
Drill, pneumatic, portable ---------- 1
Fork lift truck, 6,000 lb. capacity ---------- 1
Generator set, 1.5 KW ---------- 1
Generator set, 3KW ---------- 4
Generator set, 10KW ---------- 1
Grader, road, motorized ---------- 4
Grader-scraper attachment for road grader ---- 2
Grinder, pneumatic, horizontal ---------- 2
Kettle, heating, bitumen, trailer mounted, 165 gal ---------- 2
Light set, general illumination, 25 outlet ------- 1
Loader, scoop, 2½ cu yd ---------- 1
Mixer, concrete, trailer mounted, 16 cu ft ------ 2
Multimeter, AN/USM–223 ---------- 2
Pneumatic tool and compressor outfit, 250 cfm, trailer mounted ---------- 1
Reproduction set, diazotype machine, moist process ---------- 1
Roller, motorized, 3-wheel, 10–T ---------- 1
Shop equipment, general purpose repair, semi-trailer mounted ---------- 1
Shop equipment, woodworking, base maintenance, trailer mounted ---------- 1
Spray outfit, paint, 1 gun, 5 gal ---------- 1
Survey set, general purpose ---------- 1
Switchboard, telephone, manual, SB–22/PT ---- 1
Telephone kit, automotive maintenance, common set no. 1 ---------- 1
Telephone set, TA–312.PT ---------- 2
Tool kit, automotive maintenance, supplemental set no. 1 ---------- 1
Tool kit, automotive maintenance, common set no. 1 ---------- 1
Tool kit, automotive mechanic's ---------- 11
Tool kit, carpenter's, engineer platoon -------- 11
Tool kit, electrician's set No. 1 ---------- 7
Tool kit, light machine repair ---------- 1
Tool kit, mason and concrete finisher's --------- 1
Tool kit, pioneer, engineer platoon ---------- 3
Tool kit, pipefitter's, 2½ to 4 in. pipe --------- 1
Tool kit, pipefitter's, ⅛ to 2 in. pipe ---------- 2
Tool kit, service, refrigeration unit ---------- 2
Tool kit, sheet metal worker's ---------- 2
Tool outfit, pioneer, portable electric tools, trailer mounted ---------- 3
Tractor, airmobile, w/backhoe and front loader, ½ cu. yd ---------- 2
Tractor, full tracked, medium DBP, w/angle-dozer, scarifier, and crane ---------- 1
Welding set, arc, inert gas shielded ---------- 1
Welding shop, trailer mounted, 300 amp -------- 1

h. Method of Operation. Team functions in a manner similar to that of post engineer organization at a CONUS installation. The team leader acts as the post engineer; team members repair and maintain utilities services, structures, and roads, and do minor new construction within the team's capability. For information on repairs and utilities see the TM 5–600 series.

5–7. Team HE, Power Line

a. Mission. To provide personnel and equipment for the installation and maintenance of high voltage electric power lines.

b. Capability. Capable of installing high voltage electric power lines, including setting poles, and maintaining approximately 60 miles of high voltage electric power lines.

c. Basis of Allocation. Normally one per two electric power generator plants of 300 to 2,500 kilowatt capacity.

d. Category. III

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—14, as follows:

Number	*Grade*	*MOS*
1	LT	7611
1	E–6(NCO)	52G40
9	E–5	52G20
3	E–3	52A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cable, reel, 3½–T ---------- 1
Trailer, cargo, 1½–T ---------- 1
Truck, cargo, ¾–T ---------- 3
Truck, cargo, 2½–T ---------- 1
Truck, maintenance, earth borer, pole setter ---- 1

Other equipment

Multimeter, AN/USM–223 ---------- 3
Tool kit, carpenter's, engineer plat ---------- 1
Tool kit, electrician's, set No. 1 ---------- 9
Tool kit, electronic equipment repair ---------- 10
Voltmeter, portable ---------- 1

h. Method of Operation. Team may be divided into three sections, each responsible for the maintenance and repair of 20 miles of power line. For power line installation it is advisable to augment the team with personnel for setting poles. For information on electric power transmission and distribution see TM 5–765.

5–8. Team HF, Power Plant Operating and Maintenance

a. Mission. To provide personnel and equipment for the operation and maintenance of an electric power generating plant.

b. Capability. Capable of operating and maintaining an electric power plant containing from one to three diesel engine generators of 300 to 2,500 KW capacity.

c. Basis of Allocation. Normally attached to an area support group (ASCOM) and support group (FASCOM).

d. Category. III

e. Mobility. 33 percent mobile.

f. Strength. Aggregate—16, as follows:

Number	*Grade*	*MOS*
1	LT	7611
1	E–7(NCO)	52E40
1	E–5	52G20
2	E–5	52E20
2	E–5	52B30
2	E–4	52F20
2	E–4	52E20
4	E–4	52B30
1	E–3	52A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¾–T ---------- 1
Truck, cargo, ¾–T ---------- 1

Other equipment

Multimeter, AN/USM–223 ---------- 3
Tool kit, automotive mechanic's ---------- 6
Tool kit, carpenter's, engineer plat ---------- 1
Tool kit, electrician's, set No. 1 ---------- 3
Tool kit, precision instrument repair ---------- 1
Tool kit, electronic equipment repair ---------- 1
Torch outfit, cutting and welding, set No. 3 ---- 1

h. Method of Operation. Team is divided into two shifts to provide continuous operation of the power plant. For information on electric power generation in the field see TM 5–766.

5–9. Team HG, Pipeline Design

a. Mission. To provide personnel for assistance to construction units in the design and

supervision of specialized pipeline construction projects.

b. Capability. Capable of assisting the supported unit in:

(1) Reconnaissance and selection of sites for major tank farms, pipeline routes and appurtenant structures, offshore discharging and loading facilities, and fixed dispensing equipment.

(2) Design and layout of pipeline projects, preparation of specifications and construction estimates, selection of material and equipment, and formulation of a construction plan.

(3) Management and supervision of construction operations.

c. Basis of Allocation. Normally to an engineer construction brigade on an as-required basis.

d. Category. III

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—6, as follows:

Number	*Grade*	*MOS*
1	LTC	7932
1	CPT	7932
1	E–7(NCO)	51F40
1	E–6	81B20
1	E–4	71B30
1	E–4	81B20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¼–T ---------- 1
Trailer, cargo, ¾–T ---------- 1
Truck, cargo, ¾–T ---------- 1
Truck, utility, ¼–T ---------- 1

Other equipment

Drafting equipment set, bn ---------- 2
Interpretation kit, photographic ---------- 1
Sketching set, survey ---------- 1
Stereoscope lens, aerial photo interpretation ---- 1
Stereoscope prism–mirror ---------- 1

h. Method of Operation. Team works closely with engineer units engaged in pipeline construction and rehabilitation. It provides assistance and supervision in all phases of a project from initial survey through actual construction operations. For details on pipeline design and construction see TM 5–343.

5–10. Team HH, Real Estate

a. Mission. To provide personnel and equipment for inventorying and recording the location, extent, and the condition of real property required or occupied by army forces.

b. Capability. Capable of conducting all types of real estate transactions and preparing and executing documents required in these transactions.

c. Basis of Allocation. Normally one per Field Army Support Command, and area support group.

d. Category. III

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—16, as follows:

Number	*Grade*	*MOS*
1	MAJ	4312
1	CPT	4312
3	LT	4312
1	E–8(NCO)	51H50
2	E–6(NCO)	51H40
1	E–6	71D20
4	E–4	71B30
1	E–4	84B20
2	E–3	71A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¼–T ---------- 2
Trailer, cargo, ¾–T ---------- 1
Truck, cargo, ¾–T ---------- 2
Truck, utility, ¼–T ---------- 3

Other equipment

Camera set, still picture ---------- 1
Developing-printing kit, photographic ---------- 1
Photocopying and processing machine ---------- 1
Processing unit, photographic film, ES–20 ------ 1
Reproduction set, diazotype machine, moist process ---------- 1
Reproduction expendable supply set, moist process ---------- 1

h. Method of Operation. The team prepares real estate acquisitions and disposal documents and inventories and records the location, extent, and condition of real property required or occupied by Army forces. The team commander

and his deputy are contracting officers for real estate functions. The deputy also appraises or secures appraisals of real property and reviews and approves rental agreements and damage and restoration estimates. The other officers are responsible for negotiation and preparation of leases, licenses, termination agreements, and disposal documents, and for the investigation and processing of claims connected with real estate operations. For information on real estate operations see TM 5–300.

5–11. Team HI, Engineer Floating Power Plant (Nuclear)

a. Mission. To provide personnel and equipment for the supply of large amounts of electric power, using nuclear fuel, in support of military operations in coastal areas or along navigable waterways.

b. Capability. Capable of providing large blocks of electric power for extended periods of time independent of fuel logistics. Can provide 3 phase, 60 cycle power in ranges of 10,000 to 50,000 net kilowatts. Power can be supplied to shore and inland areas by connections to transmission systems at voltages of 13,800/ 22,900/ 33,000/44,000 or 66,000 volts. Shore transformers, shore towers, and distribution lines must exist or be provided to utilize this power. This plant must be supported by one mess team CA from TOE 29–500 series when under tow to the site, and by water distillation team(s) GK from TOE 5–520 when equipped with a distillation plant. Team HE, power line, will be needed to install and connect high voltage lines if they do not exist.

c. Basis of Allocation. Normally to a field army, logistical command, or area command on an as required basis.

d. Category. III

e. Mobility. Fixed when plant is operating. Approximately 25 percent of the team personnel accompany the plant when it is under tow.

f. Strength. Aggregate—68 as follows:

Number	*Grade*	*MOS*
1	MAJ	0009
1	CPT	0009
1	WO	351A
1	E–9(NCO)	52M50
7	E–8(NCO)	52M50
1	E–7(NCO)	91B40
9	E–7(NCO)	52M40
1	E–7(NCO)	61B40
1	E–7(NCO)	76K40
1	E–6(NCO)	05B40
4	E–6	52J20
4	E–6	52K20
5	E–6	52H20
5	E–6	52L20
2	E–5	52J20
2	E–5	52K20
2	E–5	52H20
2	E–5	52L20
2	E–5	61B30
3	E–5(NCO)	61B40
1	E–5	61C30
1	E–5	76K30
1	E–4	71B30
4	E–4	61B20
1	E–4	61C30
1	E–4	71J20
4	E–3	61A10

g. Major Items of Equipment.

Weapons

Individual weapons only.
Machine gun, cal. 50, heavy, flexible 8
Mount pedestal, machine gun, twin cal. 50 4

Vehicles

Trailer, cargo, ¼–T 1
Trailer, cargo, ¾–T 1
Truck, cargo, ¾–T 1
Truck, utility, ¼–T 1

Other equipment

Boat, utility 1
Floating nuclear power plant, type MH, 10–50 megawatts elec 1
Landing craft—LCVP (wood), BUSHIPS plan No. LCVP–8510 or 8860 1
Power supply, PP–2953/U 1
Radio set, An/GRC–106 1
Radio set, AN/PRC–25 4
Radio set, AN/SRC–6 2
Radio set, AN/SRC–8X 1
Radio set, AN/VRC–46 2
Shelter, electrical equipment, S–318/G 1
Spray gun, paint, nonbleeder type 2
Surgical equipment and supply set, individual 1
Tool kit, canvas worker's 1
Tool kit, general mechanic's, rail and marine diesel repair 1
Tool kit, radar and radio, repairman 1
Tool kit, welder's 1
Tool kit, armorer's 1
Water quality control set 2

h. Method of Operation.

(1) The floating nuclear power plant is towed from site to site by an ocean-

going tug. The master of the towing vessel is responsible for the safety and satisfactory accomplishment of this operation.

(*a*) Approximately one-fourth of the crew remain on the vessel during towing operations. The remainder constitute the advance party and rear echelon and are airlifted or transported by surface carrier to the new operational site.

(*b*) The nuclear reactor is shut down and depressurized while under tow. Ship's power and heat and other ship's services are provided by operation of auxiliary diesel generators, boilers, and equipment.

(2) The team is organized into a team headquarters and three sections with functions as follows (fig. 5–1):

(*a*) Team headquarters provides the command supervision for the operation and maintenance of the floating nuclear power plant, and personnel for handling administrative activities pertaining to the plant and vessel operations.

(*b*) The plant process and radiation control section provides the supervision for all phases of process control, health physics, and radiological safety in the plant.

(*c*) The plant operations section provides the supervisory and operational personnel for the safe and efficient operation of the plant.

(*d*) The maintenance and deck section provides the supervisory and operational personnel for the repair and maintenance of the nuclear power plant, the vessel, and auxiliary equipment.

(3) Each operator in the nuclear power plant is a specialist in two areas: first, operation of nuclear power plants; and second, maintenance in one of four specialty areas, either mechanical, electrical, instrument, or process control. This cross-training and cross-utilization is continued throughout his experience, and provides for teamwork and allows flexibility of assignment and utilization of personnel. Four complete operating shifts are necessary to provide continuous generation of power on a 24-hour day, 7 day week basis.

(4) Because of the potential radiation hazard, the team is normally quartered ashore and provided subsistence by attachment to an appropriate unit in the shore or port complex. Where this is not possible, the unit is augmented with a mess team. The operating crew on duty eats one meal on board during their eight hour shift; this meal is prepared ashore and brought aboard.

(5) Emergency hospital space, with equipment, is provided on board the vessel. A medical field assistant is a member of the detachment and is the only medical support for the crew while the vessel is under tow. Upon arrival at the site, medical support is provided by the shore unit.

(6) The vessel is fitted with necessary repair parts and tools to maintain the power plant equipment and auxiliaries. Special requisitions are necessary to replenish non-standard items not available through normal military channels.

(7) A minimum of two vehicles is required to provide transportation for the officer-in-charge, the technical staff officer, shift changes, supply pickup, and shore operations to include limited powerline maintenance and/or installation. One 26-foot utility boat and one 36-foot landing craft (LCVP) transport shift personnel, supplies, and equipment, and place the submarine power cable from the

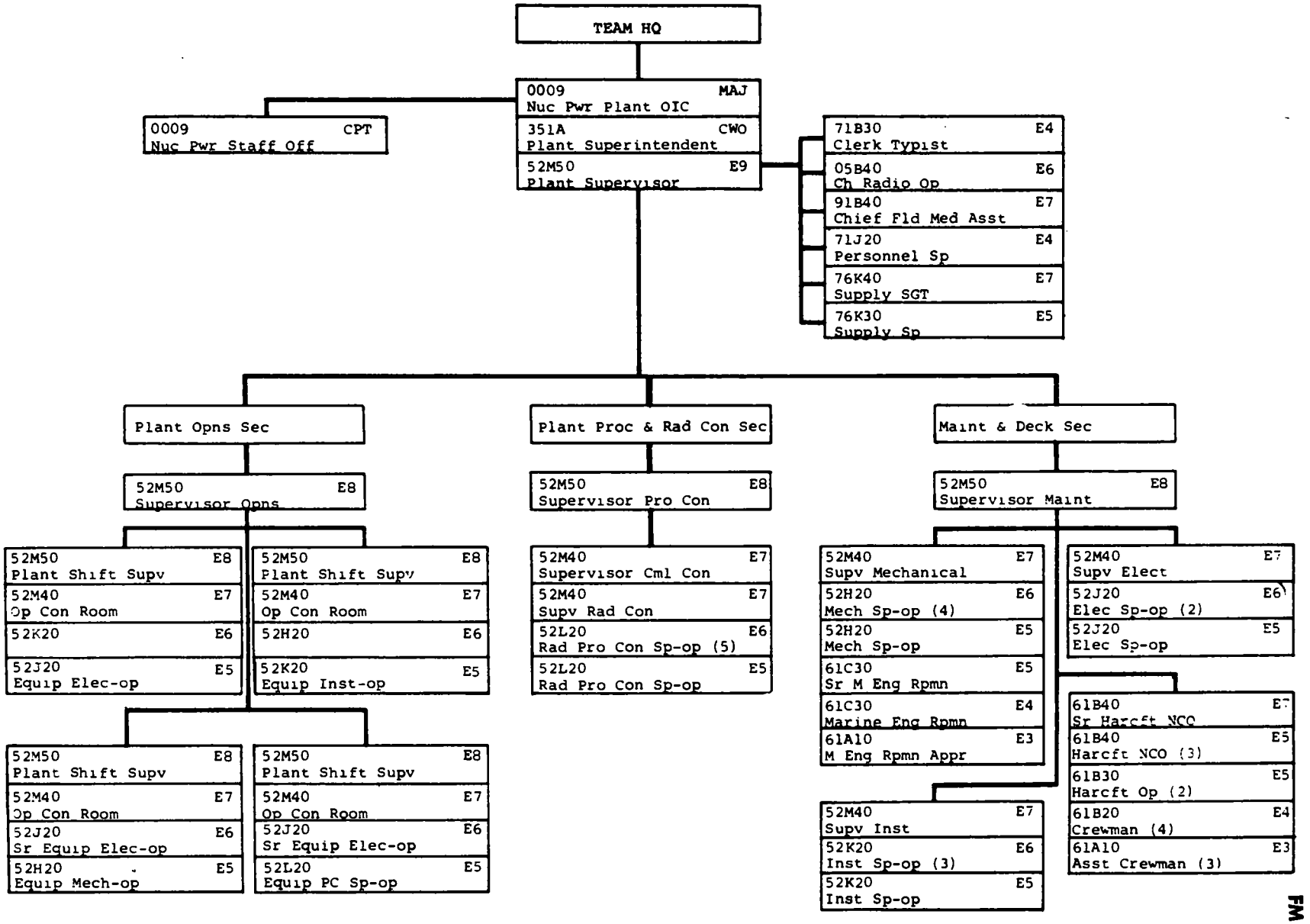


Figure 5–1. Organization chart, Team HI.

vessel to shore when off-shore operation is required.

(8) The vessel is equipped with ship-to-shore and ship-to-ship voice radio communications for operation on Coast Guard and emergency frequencies, harbormaster nets, and for contact with the towing vessel. Standard marine sound and visual signalling equipment is also provided. U.S. Army tactical radio transmitting and receiving equipment is required to permit communications with the higher army headquarters. Portable radio sets provide internal communications to powerboats and vehicles.

CHAPTER 6

ENGINEER TOPOGRAPHIC AND INTELLIGENCE TEAMS, TOE 5–540

6–1. Introduction

TOE 5–540 consists of ten teams of various sizes and types, whose mission is to provide specialized personnel and equipment for engineer topographic and intelligence support as required.

6–2. Team IA, Survey

a. Mission. To provide personnel and equipment for topographic and artillery fire control support surveys.

b. Capability. Capable of performing topographic reconnaissance and surveying for topographic mapping, and establishing 2d, 3d, and 4th order ground control for missile support, surveillance devices, and conventional artillery. Requires aircraft, FADAC (field artillery digital automatic computer), and survey tower support from the unit which it reinforces.

c. Basis of Allocation. Normally assigned to a topographic unit whose survey tasks exceed organic capabilities.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—15, as follows:

Number	*Grade*	*MOS*
1	WO	821A
2	E–6(NCO)	82E40
1	E–6	82D30
1	E–5	82E20
2	E–5	82D30
1	E–4	82E20
3	E–4	82D30
1	E–4	41B20
2	E–3	82A10
1	E–2	82A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo ¾–T ---- 4
Truck, cargo, ¾–T ---- 4

Other equipment

Altimeter, surveying ---- 3
Astronomic position set ---- 1
Detecting set, mine, portable, metallic ---- 1
Detector set, mine, microwave ---- 1
Generator set, 1.5 KW, 25 V, DC ---- 4
Generator set, 1.5 KW, 120 V, AC ---- 2
Interpretation kit, photographic ---- 1
Panel marker, aerial liaison ---- 2
Radio set, AN/GRC–106 ---- 4
Radio set, AN/PRC–25 ---- 4
Stereoscope lens, aerial photo interpretation ---- 2
Survey instrument, distance measuring, electronic, microwave, miniature, dual purpose unit ---- 3
Survey instrument, azimuth, gyroscopic, artillery ---- 1
Survey set, plane table, 5-man, topo survey ---- 1
Survey set, precise traverse, taping and stadia methods ---- 1
Survey set, triangulation, reconnaissance specialist ---- 1
Survey set, triangulation, principal observer and signal tender ---- 3
Survey set, supplemental equipment, topo bn ---- 1
Target, survey, beacon ---- 3
Tent, observing, astronomic ---- 3
Tool kit, precision instrument repair ---- 1

h. Method of Operation. Team performs reconnaissance and survey missions as required. Operates as a single large party or may be divided into smaller parties (two or three) for several simpler missions. For information on topographic surveying see TM 5–441.

6–3. Team IB, Photomapping Platoon

a. Mission. To provide personnel and equipment for the compilation and revision of planimetric, topographic, and special maps and map substitutes; and for extension of ground control by photogrammetry for artillery and missile fire.

b. Capability. Capable of the following:

(1) Compilation of photomaps and mosaics, controlled and uncontrolled.

(2) Compilation of a limited number of new maps from aerial photography, existing maps, charts and other sources.

(3) Limited revision of existing maps.

(4) Drafting special maps, overprints, overprints and overlays for operational use and for terrain and engineer intelligence studies.

(5) Provision of point locations for mapping and fire control through limited extension of ground control by photogrammetric means from a strip or strips of aerial photographs.

c. Basis of Allocation. Normally attached to an engineer topographic battalion whose photomapping tasks exceed its organic capability.

d. Category. II

e. Mobility. 80 percent mobile.

f. Strength. Aggregate—44, as follows:

Number	*Grade*	*MOS*
1	LT	7915
1	WO	811A
1	E–7(NCO)	81G40
2	E–6(NCO)	81C40
1	E–6(NCO)	81D40
4	E–5	81C20
4	E–5	81D20
2	E–5	81D30
1	E–5	82E20
1	E–4	82E20
8	E–4	81C20
5	E–4	81D20
3	E–4	81D30
1	E–4	52B20
2	E–4	83C20
1	E–4	41B20
5	E–3	81A10
1	E–3	83A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Chassis, trailer, 2½–T ---- 2
Trailer, cargo, ¾–T ---- 1
Truck, cargo, ¾–T ---- 1

Other equipment

Book set, topographic bn, photomapping co ---- 1
Cartographic section, topographic mapping set, truck mtd ---- 1
Composing machine, changeable type, plate style, 24 in paper size ---- 1
Composing machine, photo printing type ---- 1
Copy and supply section, topographic mapping set, truck mtd ---- 1
Detecting set, mine, portable, metallic ---- 1
Detector set, mine, microwave ---- 1
Drafting equipment set, supplemental, plastic scribing ---- 6
Generator set, 30 KW ---- 2
Light set, general illumination, 25 outlet ---- 1
Map revision section, topographic mapping set, truck mtd ---- 1
Multiplex section, topographic mapping set, truck mtd ---- 1
Panel marker, aerial liaison ---- 4
Photomapping section, topographic mapping set, truck mtd ---- 1
Processing machine, photogrammetric, diapositive plates ---- 1
Rectifier section, topographic mapping set, truck mtd ---- 1
Stereoscope lens, aerial photo interpretation ---- 10
Stereoscope prism-mirror ---- 1
Supplemental equipment set, topographic photomap ---- 1
Tool kit, automotive mechanic's ---- 1
Tool kit, carpenter's ---- 1
Tool kit, electrician's ---- 1
Tool kit, precision instrument repair ---- 1
Tool kit, service, refrigeration unit ---- 1

h. Method of Operation. The team is organized into a platoon headquarters, a compilation section, and a cartographic section. The compilation section uses survey data and aerial photos to prepare mosaics, working diagrams, and map compilation sheets. The cartographic section uses the output of the compilation section to prepare the map manuscript. Platoon headquarters personnel provide the necessary command and supervision, perform organizational maintenance on photomapping equipment, and edit the work of the two sections. Water required for the photographic process must be furnished by the supported unit. For detailed information on map compilation and revision and on multiplex mapping see TM 5–240 and TM 5–244.

6–4. Team IC, Map Reproduction Platoon

a. Mission. To provide personnel and equip-

ment for printing maps, map substitutes, and other engineer intelligence material from original manuscripts.

b. Capability. Capable of reproducing, by offset lithography, monochrome and multicolor maps, map substitutes, photomaps, overlays, overprints, and other engineer intelligence and terrain intelligence materials at the approximate rate of 3.5 million impressions per month, working two shifts per day.

c. Basis of Allocation. Normally attached to an engineer topographic unit whose map reproduction requirements exceed its organic capabilities.

d. Category. II

e. Mobility. 80 percent mobile.

f. Strength. Aggregate—51, as follows:

Number	*Grade*	*MOS*
1	LT	7915
1	WO	831A
1	E–7(NCO)	83F40
1	E–7(NCO)	83Z40
1	E–6(NCO)	83F40
3	E–6(NCO)	83Z40
1	E–5(NCO)	83Z40
1	E–5	52B30
8	E–5	83F20
4	E–5	83E20
2	E–5	83D20
8	E–4	83F20
4	E–4	83D20
4	E–4	83E20
1	E–4	41K20
10	E–3	83A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Chassis, trailer, 2½–T ---3
Trailer, cargo, ¾–T ---2
Truck, cargo, ¾–T ---2
Truck, van, expansible, 2½–T ---1
Truck, van, shop, 2½–T ---1

Other equipment

Camera section, topographic reproduction set, truck mtd ---1
Cutter, paper, guillotine, floor mounting, electric motor driven ---1
Generator set, 45 KW ---3
Laboratory section, topographic reproduction set, truck mtd ---1
Map layout section, topographic reproduction set, truck mtd ---1
Photomechanical process section, topographic reproduction set, truck mtd ---1
Plate process section, topographic reproduction set, truck mtd ---1
Press section, topographic reproduction set, truck mtd ---4
Tool kit, automotive mechanic's ---1
Tool kit, electrician's ---1
Tool kit, light machine repair ---1

h. Method of Operation. The platoon is organized into a platoon headquarters, a photographic section, a plate and layout section, and a press section. Platoon headquarters personnel provide the necessary command and supervision and perform organizational maintenance on the reproduction and power generating equipment. The photographic section makes copy negatives or positives from map manuscripts or other material. The plate and layout section makes offset press plates from the copy positives. The press section prints maps, photomaps, overlays, overprints, and other material. The supported unit provides the necessary water. For information on map reproduction see TM 5–245.

6–5. Team ID, Map Distribution Platoon

a. Mission. To provide personnel and equipment for the receipt, storage, and issue of maps and related engineer intelligence material.

b. Capability. Capable of handling approximately 150,000 sheets per day received and shipped in bulk with minimum retail deliveries.

c. Basis of Allocation. Normally one to three per topographic battalion to operate forward map depots.

d. Category. II

e. Mobility. 80 percent mobile.

f. Strength. Aggregate—38, as follows:

Number	*Grade*	*MOS*
1	LT	7915
1	E–6(NCO)	76C40
1	E–5(NCO)	56B40
1	E–5(NCO)	76C40
2	E–5	76C20
7	E–4	76C20
4	E–4	56B20
3	E–3	56B20
6	E–3	76A10
6	E–3	56A10
6	E–2	56A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Chassis, trailer, 2½–T ---------- 1
Semitrailer, van, cargo, 12–T ---------- 2
Trailer, cargo, ¾–T ---------- 2
Truck, cargo, ¾–T ---------- 2
Truck, cargo, 2½–T ---------- 1
Truck, tractor, 5–T ---------- 2

Other equipment

Generator set, 15 KW ---------- 1
Light set, general illumination, 25 outlet ---------- 2
Map distribution set, portable ---------- 1
Shop equipment, woodworking, base maintenance, trailer mtd ---------- 1
Tool kit, carpenter's ---------- 1
Truck, hand, lift pallet, 4000 lb. capacity ---------- 1
Truck, hand, 2-wheeled ---------- 2

h. Method of Operation. The platoon normally operates an advance map depot for a base topographic battalion or a forward map depot for an army topographic battalion. On occasion it may operate a corps map depot for a corps topographic company. The platoon is usually organized into a platoon headquarters for command and supervision and three sections; receiving, storing, and shipping. For details on map distribution see FM 5–146 and FM 101–10–1.

6–6. Team IE, Geodetic Survey

a. Mission. To provide personnel and equipment to accomplish, instruct in, or supervise 1st order astronomic observation surveys and computations.

b. Capability. Capable of accomplishing 1st order leveling and 1st order astronomic azimuth and position surveys. May also supervise or instruct survey personnel of other topographic units in high order surveying.

c. Basis of Allocation. Normally one per topographic battalion.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—20, as follows:

Number	*Grade*	*MOS*
1	LTC	7915
1	MAJ	7915
1	CPT	7915
1	WO	821A
1	E–6(NCO)	82D40
4	E–6	82E30
2	E–6	82D30
2	E–5	82D20
1	E–4	81C20
1	E–4	71B30
2	E–4	82D20
1	E–4	41B20
1	E–3	82A10
1	E–2	82A10

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Trailer, cargo, ¼–T ---------- 1
Trailer, cargo, ¾–T ---------- 2
Trailer, cargo, 1½–T ---------- 1
Truck, cargo, ¾–T ---------- 2
Truck, cargo, 2½–T ---------- 1
Truck, utility, ¼–T ---------- 1

Other equipment

Computing and drafting equipment set, field survey data ---------- 1
Generator set, 1.5 KW ---------- 2
Interpretation kit, photographic ---------- 1
Radio set, AN/GRC–106 ---------- 3
Radio set, AN/PRC–25 ---------- 4
Stereoscope lens, aerial photo interpretation ---- 1
Stereoscope, prism-mirror ---------- 1
Survey set, astronomic position ---------- 2
Survey set, precise traverse, taping and stadia method ---------- 1
Survey set, supplemental equipment, topographic bn ---------- 2
Tent, observing, astronomic ---------- 1
Theodolite, survey, direct, first order, w/tripod --2
Tool kit, precision instrument repair ---------- 1

h. Method of Operation. Team may be organized into two survey sections and a headquarters section. Team makes 1st order surveys in support of a theater of operations survey program and for artillery and guided missile fire control. It may also instruct personnel of other topographic units in high order surveying or supervise their operations in this task. For information on geodetic surveying see TM 5–441 and US Coast and Geodetic Survey Special Publication No's. 225, 237, 239, and 247.

6–7. Team IF, Terrain

a. Mission. To provide personnel and equipment for the collection, evaluation, production, and dissemination of military terrain data.

b. Capability. Capable of the following:

(1) Producing general and detailed military terrain studies and related intelligence data in such fields as geography, routes of communication, beaches, hydrology, urban areas, utilities, and evaluative subjects such as ground mobility, airborne operations, and suitability for construction.

(2) Field collection of data and on-site reconnaissance.

(3) Machine processing, storage, and retrieval of data.

(4) Consulting services in fields of responsibility.

c. Basis of Allocation. Normally one per field army and separate corps; to a force less than a corps for given operations.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—13, as follows:

Number	*Grade*	*MOS*
1	MAJ	9301
1	CPT	7940
1	CPT	7900
1	CPT	7020
1	CPT	7140
1	CPT	7902
1	E–8(NCO)	12D50
2	E–6	51Q20
1	E–5	51G20
1	E–4	81C20
2	E–4	71B30

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¼–T ---------- 1
Trailer, cargo, ¾–T ---------- 2
Trailer, cargo, 1½–T ---------- 1
Truck, cargo, ¾–T ---------- 2
Truck, cargo, 2½–T ---------- 1
Truck, utility, ¼–T ---------- 1

Other equipment

Adapter back, photographic film, LE–19 ---------- 1
Book set, construction group ---------- 1
Camera, Polaroid model 101 ---------- 1
Camera set, still picture, KS–4 ---------- 1
Camera set, still picture, KS–15 ---------- 1
Dividers, drafting, proportional ---------- 2
Drafting equipment set, bn, charts, sketches, and overlays ---------- 1
Drafting machine, 24 in long arm ---------- 2
Drawing board and trestle, 60 by 42 in. ---------- 2
Flash unit, photographic, repeating, LM–33 ---------- 1
Generator set, 1.5 KW ---------- 1
Interpretation kit, photographic ---------- 1
Light set, general illumination, 25 outlet ---------- 1
Meter, photographic exposure, LM–46 ---------- 1
Planimeter, polar ---------- 1
Stereoscope lens, aerial photo interpretation ---------- 2
Stereoscope, prism-mirror ---------- 1
Straightedge, steel, drafting ---------- 1
Telephone set, TA–312/PT ---------- 2
Template and tracer pin, military symbols ---------- 1
Tool kit, carpenter's ---------- 1
Tripod, photographic, LM–15 ---------- 1

h. Method of Operation. The team's officer specialists, assisted by the enlisted personnel, compile graphic and tabular data, using automatic data processing (ADP) where required. Materials used include; published allied and captured documents, aerial photography, raw data secured from field surveys by team members or other armed forces elements, and information and intelligence from higher and lateral headquarters. Data are published as overlays and overprints to existing maps or as separate graphics, and with accompanying tabular/textual data, including tabular runs from ADP. Final drafting and printing support are provided by topographic units when needed. For information on terrain intelligence see FM 30–10.

6–8. Team IG, TOPO Planning and Control

a. Mission. To provide personnel and equipment for the planning, supervision, and control of a large mapping, surveying, and related engineer intelligence program.

b. Capability. Capable of planning and supervising the mapping and related engineer intelligence activities of a major command (field army or larger) to include—

(1) Supervision, collection, maintenance, and dissemination of topographic and artillery fire control survey data.

(2) Coordination and evaluation of map and engineer intelligence reproduction facilities and planning the employment of these facilities.

(3) Supervision of map depot operations.

(4) Maintaining liaison with higher headquarters and allied forces.

(5) Coordination of indigenous mapping and reproduction facilities in accomplishing the command mapping mission.

c. Basis of Allocation. Normally one per field army or higher headquarters as required.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—20, as follows:

Number	*Grade*	*MOS*
1	LTC	7915
1	MAJ	9301
2	MAJ	7915
3	CPT	7915
1	LT	7915
1	E–8(NCO)	81C50
1	E–7(NCO)	81D40
1	E–7(NCO)	12D40
1	E–7(NCO)	96B40
1	E–7(NCO)	76C40
1	E–7(NCO)	83Z40
1	E–7(NCO)	82D40
1	E–6	51Q20
1	E–4	81C20
3	E–4	71B30

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¼–T ---------- 1
Trailer, cargo, ¾–T ---------- 1
Trailer, cargo, 1½–T ---------- 1
Truck, cargo, ¾–T ---------- 1
Truck, cargo, 2½–T ---------- 1
Truck, utility, ¼–T ---------- 1

Other equipment

Book set, topo, general purpose ---------- 1
Book set, topo bn, photomapping company ---------- 1
Book set, topo bn, reproduction company ---------- 1
Drafting equipment set, battalion, charts sketches, and overlays ---------- 1
Drawing board and trestle, 42 by 31 inches ---------- 2
Generator set, 1.5 KW ---------- 1
Lettering set, vertical and angular lettering ---------- 1
Light set, general illumination, 25 outlet ---------- 1
Planimeter polar ---------- 1
Stereoscope lens, aerial photo interpretation ---------- 6
Stereoscope, prism-mirror ---------- 1
Template and tracer pin, military symbols ---------- 1

h. Method of Operation. The team acts as a special section under the staff engineer in the headquarters of the command to which it is assigned or attached—theater army, army group, or field army. The team chief acts as the staff topographic specialist. The team assists in developing and promulgating command policies and directives in mapping and related activities, and supervises their implementation. For details of mapping functions of the Corps of Engineers see TM 5–231.

6–9. Team IH, Photographic Evaluation

a. Mission. To provide personnel and equipment for the evaluation of aerial photography to determine its suitability for mapping.

b. Capability. Capable of preparing contact prints and diapositive plates from USAF aerial photography negatives; inspecting negatives and contact prints to evaluate the suitability of the photography for the compilation of military topographic maps.

c. Basis of Allocation. Normally one to an engineer topographic battalion.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—8, as follows:

Number	*Grade*	*MOS*
1	WO	811A
2	E–5	81D30
2	E–4	81D30
2	E–4	83D20
1	E–3	83A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¼–T ---------- 1
Trailer, cargo, 1½–T ---------- 2
Truck, utility, ¼–T ---------- 1

Other equipment

Drawing board and trestle, 60 by 42 in ---------- 2
Generator set, 10 KW ---------- 2
Lettering set, vertical and angular lettering ---------- 1
Multiplex section, topographic mapping set, truck mtd ---------- 1
Photomechanical process section, topographic reproduction set, truck mtd ---------- 1
Straightedge steel 42 in ---------- 1
Template and tracer pin, military symbols ---------- 1
Tool kit, carpenter's ---------- 1
Trimmer, paper ---------- 1

h. Method of Operation. The team is usually located at a USAF photographic unit base.

Negatives and contact prints are inspected by team members for warpage, distortion, negative quality, and adequate stereoscopic coverage. Diapositive plates are made from those negatives found suitable. For information on cartographic aerial photography see TM 5–240 and TM 5–243.

6–10. Team IJ, Survey (Airborne)

a. Mission. To provide jump-qualified personnel and equipment for topographic and artillery fire control support surveys, for an airborne corps or independent airborne force to include survey support of the engineer combat battalion (airborne).

b. Capability. Capable of performing reconnaissance and surveying for topographic mapping, and establishing 2d, 3d, and 4th order ground control for missile support, surveillance devices, and conventional artillery. Requires aircraft, FADAC, and survey tower support from the unit which it reinforces. Personnel and equipment can be airdropped at operational sites.

c. Basis of Allocation. Normally assigned to a topographic unit.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—15, as follows:

Number	*Grade*	*MOS*
1	WO	821A7
1	E-6(NCO)	82E4P
1	E–6(NCO)	82D4P
1	E–6	82D3P
2	E–5	82E2P
2	E–5	82D2P
3	E–4	82D2P
1	E–4	41B2P
2	E–3	82A1P
1	E–2	82A1P

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Trailer, cargo, ¾–T ---- 4
Truck, cargo, ¾–T ---- 4

Other equipment

Altimeter, surveying ---- 3
Astronomic position set ---- 1
Detecting set, mine, portable, metallic ---- 1
Detector set, mine, microwave ---- 1
Generator set, 1.5 KW 28V, DC ---- 4
Generator set, 1.5 KW 120V, AC ---- 2
Interpretation kit, photographic ---- 1
Panel marker, aerial liaison ---- 2
Radio set, AN/GRC–106 ---- 4
Radio set, AN/PRC–25 ---- 4
Stereoscope lens, aerial photo interpretation ---- 2
Survey instrument, distance measuring, electronic, microwave, miniature, dual purpose unit ---- 3
Survey instrument, azimuth, gyroscopic, artillery ---- 1
Survey set, plane table, 5 man, topo survey ---- 1
Survey set, precise traverse, taping and stadia methods ---- 1
Survey set triangulation, reconnaissance specialist ---- 1
Survey set, triangulation, principal observer and signal tender ---- 3
Survey set, supplemental equipment, topo bn ---- 1
Target, survey, beacon ---- 3
Tent, observing, astronomic ---- 3
Tool kit, precision instrument repair ---- 1

h. Method of Operation. Team jumps into an operational area to perform reconnaissance and survey missions as required. It operates as a single large party or may be divided into two or three smaller parties for several simpler missions. For details on topographic surveying see TM 5–441.

6–11. Team IL, Military Hydrology

a. Mission. To provide personnel and equipment for the preparation of hydrologic and hydraulic analyses and studies in connection with military operations.

b. Capability. Capable of predicting river stages and discharges, and natural and artificial flood velocities, depths, and widths, in a drainage basin with an area up to 1,000 square miles; preparing hydrologic analyses of river crossings sites and detail environments; preparing studies of hydrologic and hydraulic factors involved in military installations from a point of view of flood and tidal incidence; providing technical advice on hydraulic features of logistic operations and on equipment for use in water. When necessary the theater commander will provide for the allocation of additional communication facilities and for joint operation of Air Weather Service Units Naval Hydrographic units and Corps of Engineers units.

c. Basis of Allocation. Normally one per field army or independent corps; may be assigned to a geographic area, determined by stream and drainage basin characteristics.

d. Category. II

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—22 as follows:

Number	*Grade*	*MOS*
1	MAJ	7900
1	CPT	7900
1	CPT	7940
1	CPT	7915
1	LT	8204
1	E–6(NCO)	82D40
2	E–5	82D20
1	E–4	81C20
2	E–4	71B30
1	E–4	76C20
2	E–4	82E20
2	E–4	01D20
2	E–4	01F20
2	E–3	01D20
1	E–3	01F20
1	E–3	05B20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Trailer, cargo, ¼–T ----1
Trailer, cargo, ¾–T ----5
Truck, cargo, ¾–T ----5
Truck, utility, ¼–T ----1

Other equipment

Altimeter, surveying ----2
Astrolabe, pendulum, 60 degree instrument, altitude ----2
Astronomical attachment for transit or theodolite ----2
Astronomic position set ----2
Boat, reconnaissance, pneumatic, 3–man ----2
Drafting machine, 24 in. long arm ----1
Driver, projectile unit, power activated, underwater ----1
Duplicating machine, stencil process ----1
Float, copper rod, 25 mm ID by 12 in. long ----24
Float gage, portable, automatic water-storage recording ----2
Gage, precipitation ----20
Gage, hook, weir ----10
Generator set, 1.5 KW, 28V, DC ----1
Generator set, 5 KW, 120/208/240V, 60 cycle, AC, 1-or 3-phase ----1
Geodimeter, 50 KM range ----1
Hygrometer, dial indicating, electrolytic type ----2
Indicator, wind direction and speed ----5
Light set, general illumination, 25 outlet ----1
Meter, current, water, pygmy-type ----4
Meter, current, Price, type A ----2
Planimeter, polar ----2
Printing and heat developing machine ----1
Radio set, AN/GRC–106 ----1
Radio set, AN/VRC–46 ----4
Reel equipment, CE–11 ----1
Refraction system, multi-trace, GT–2, portable ----1
Refraction seismograph, Terra-Scout ----1
Reproduction set, diazotype machine ----1
Sketching set, survey, military field sketch ----2
Staff, gage, 2 meters long ----24
Stilling device, 1 meter long ----24
Survey set, precise level ----2
Telephone set, TA–1/PT ----1
Telephone set, TA–312/PT ----1
Tent, observing, astronomic ----2
Test set, soil trafficability ----2
Thermometer, self-indicating, minus 60 to plus 160 degrees F ----4
Tool kit, carpenter's ----1
Tool kit, general use tools ----1
Tool kit, pioneer, engineer squad ----1

h. Method of Operation. The team is organized into a headquarters and four branches; precipitation, hydraulic surveys, analysis and prediction, and administration and supply. The team provides hydraulic and hydrologic information as follows:

(1) *Floods.* The team makes a preliminary literature and field study of the streams or basin for which flood predictions are to be issued. Reconnaissance to determine proper locations of stream and precipitation gages is made, techniques are established, and a suitable prediction organization, utilizing personnel assistance from available engineer field units, is activated through the army or separate corps engineer. Gage readings are established and correlated with existing data as available. Rain-fall-runoff and gage relationships, hydrographs, and flood-routing curves or coefficients are computed. Field survey parties make discharge measurements, locate high water marks, and determine flood profiles. From these data are established the specific techniques to be used in forecasting floods. When gage date or weather forecasts indicate possible flooding the analysis and prediction branch initiates flood fore-

casts. If flooding occurs, gage data collected during the flood are compared with the predictions, and data is adjusted so as increase the accuracy of future forecasts.

(2) *River crossing sites.* Hydrologic studies of tentative river crossing areas to determine stream depths, widths, and velocities are given to the advance planners of methods to be used in the crossing. During the crossing period, planners, operators, and units will require round-the-clock forecasts. Many of the techniques of data collection, analysis, and dissemination of flood prediction data apply to this aspect of the team's work.

(3) *Advance studies.* The team provides a general analysis of river and basin characteristics for use in planning strategic and tactical operations. Analysis of streams as barriers with modifications caused by storm run-off or artificial flooding; effects of flooding on approaches; and effects of use of water for power, navigation, and irrigation on operations are typical data presented.

(4) *Artificial flood studies.* Effects on military operations of—

(*a*) Creating major flood waves by sudden breaching of a dam or other hydraulic structure.

(*b*) Detrimental stream-flow variations caused by opening and closing outlet works of water control structures, thereby washing away or damaging bridges downstream.

(*c*) Creation of still water barriers by breaching levees and flooding land.

(*d*) Drainage obstacles or mud flats created by cutting off natural drainage, destroying pumping facilities and draining reservoirs.

(5) *Hydrologic analysis of sites, logistic operations and equipment.* The team produces data for the commander as to suitability of sites for military installations; protection of sites from floods; operation of navigation facilities, hydroelectric power plants, and water works. Military equipment for use in water such as boats and bridges is selected for an operation after considering hydrologic intelligence as to velocities, depths, and surface conditions prevailing in the streams to be crossed.

i. Reference. For information on the military aspects of hydrology and geology see TM 5–545.

CHAPTER 7

ENGINEER DREDGE TEAMS, TOE 5–500

7–1. Introduction

a. General. TOE 5–500 consists of five teams of various sizes and types, whose mission is to provide specialized personnel and equipment for dredging operations.

b. Personnel Qualifications. In addition to possessing the requisite skills and knowledge of their respective MOS's, the ship's master, mates, and engineers must have the appropriate US Coast Guard license.

c. Communications. The dredge with which each team is equipped has installed US Coast Guard approved radios and radio-telephones. This equipment provides communication with land-based installations and, for the seagoing hopper dredge only, other ships at sea.

d. Capability. The productive capacity of any team, in volume dredged per unit time, cannot be predetermined. It will depend on the size of dredge, type of material being dredged, distance to disposal area, and other factors which can be determined only at the job site.

e. Dredge Types. Of the five teams organized under TOE 5–500 three are equipped with seagoing hopper dredges and two with cutterhead pipeline dredges. Both of these types are hydraulic dredges; that is they remove bottom material by "sucking up" a mixture of water and solids. However, their methods of operation are quite different.

(1) *Seagoing hopper dredge.* This dredge is fitted with hoppers in its hull to carry the dredged material to a dumping areas. It is a self-propelled, highly maneuverable vessel, capable of excavating bottom material without anchoring. The hopper dredge transports and dumps material without assistance from auxiliary plant. The seagoing hopper dredge can operate in the rough waters encountered in harbor entrances, dredging channels without interfering with shipping. Unlike other dredging plants, it is fully seaworthy and can make ocean voyages to new work stations.

(2) *Cutterhead pipeline dredge.* This dredge has been built in both self-propelled and nonself-propelled types, depending upon its intended use. For the dredging operation, self-propulsion motors are not used. These dredges are held in position by spuds (usually of heavy steel tube construction) located at the stern of the dredge and arranged to raise and lower vertically. The spuds are of such length that when lowered they will penetrate the bottom. One of the spuds is known as the "working" spud and the other as the "walking" spud. The cycle of operation is practically continuous. First, the working spud is lowered and used as a pivot. The dredge, with its cutter and pump in operation, is swung from side to side by means of a swinging winch which hauls in and pays out wire ropes that are attached to anchors, one on each side of the dredge. Thus a channel is cut of a width equal to the swing. When the dredge is advanced for the next cut, the other spud is lowered and the one previously used as a pivot is raised. The dredge is swung by hauling in on one of the two anchor cables placed forward on each side of the dredge. When the dredge has been advanced

to the new position, the spuds are interchanged and the dredging operation is resumed. The suction pipe of the dredge is carried on a steel frame or "ladder" in its bow, hinged to permit lowering the front end into the bottom. At the front end of the ladder is mounted the cutter. The suction pipe entrance lies within the lower half of the area circumscribed by the cutter blades. The cutter loosens the bottom materials and mixes them with water for pumping. The dredge pump, which is of the centrifugal type, is located between the suction and discharge lines. The suction side of this pump is connected to the upper end of the dredge suction pipe and the pressure side of the pump is connected to the dredge discharge pipe. The discharge lines, with lengths up to several thousand feet, may be carried on pontoons or barges to a dumping area or a shore fill area. The dredge is versatile and very efficient in protected waters, and where the obstruction of its pipelines and swinging lines presents no problems.

f. References. Information on dredges and dredging operations is contained in TM 5–360 and TM 5–622.

7–2. Team JA, Dredge, Cutterhead, Pipeline, 12- to 16-Inch

a. Mission. To provide personnel and equipment for dredging operations, using a 12- to 16-inch cutterhead, pipeline dredge.

b. Capability. Capable of operating and maintaining one of a group of diesel-powered, 12- to 16-inch cutterhead, pipeline dredges on a round-the-clock, 7 day per week basis. Must be augmented by one mess team CA and one mess team CB from the TOE 29–500 series. Typical of the dredges in this group is a 16-inch self-propelled dredge with the following physical and operational characteristics:

Length ---------- 200 ft, 6 in
Beam ---------- 36 ft, 8 in
Maximum draft ---------- 5 ft, 10 in
Dredge pump ---------- 1 each diesel powered, 16-inch discharge
Twin screws, diesel powered, 350 HP per shaft
Dredging depth:
  Maximum ---------- 30 ft
  Minimum ---------- 8 ft
Cutterhead ladder w/18 in suction line
  Speed ---------- 8.5 mph
  Vertical clearance ---------- 51 ft, 3 in
  Spuds (2 each) ---------- 40 ft, 6 in long

c. Basis of Allocation. Normally assigned to an engineer group/brigade or area support group.

d. Category. III

e. Mobility. 100 percent mobile afloat, when dredge is self-propelled or provided with a towing vessel.

f. Strength. Aggregate—43, as follows:

Number	*Grade*	*MOS*
1	MAJ	0820
1	CPT	0823
1	CPT	0820
1	LT	0823
1	LT	0820
4	WO	562A
2	WO	561A
2	E–7(NCO)	61B40
4	E–5	62F30
1	E–5	91B30
5	E–4	61B20
1	E–4	71H20
1	E–4	61C30
1	E–4	44C30
1	E–4	71J20
3	E–4	51F20
2	E–4	61B30
7	E–3	61A10
1	E-3	71A10
2	E–3	51A10
1	E–2	51A10

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

None

Other equipment

Barge, deck cargo, nonpropelled, steel, 130–T, 81 ft ---------- 2
Barge, deck cargo, nonpropelled, steel, 585–T, 120 ft ---------- 1
Boat, bridge erection, 27 ft long ---------- 1

Dredge, hydraulic, pipeline, cutterhead type, diesel engine powered ----------1
OR
Dredge, hydraulic, pipeline, cutterhead type, steam powered, oil burning ----------1
Surgical instrument and supply set, individual --1

h. Method of Operation. Team is organized into three sections; command, power plant, and deck operation. The command section provides overall supervision of dredge operations and administrative services for the team. The power plant section operates, maintains, and repairs the power equipment aboard the dredge. The deck operation section operates and moves the dredge as required during dredging operations and constructs and maintains the discharge pipeline in lengths up to 2500 feet.

7–3. Team JB, Dredge, Cutterhead, Pipeline, 18- to 24-Inch

a. Mission. To provide personnel and equipment for dredging operations, using an 18- to 24-inch cutterhead, pipeline dredge.

b. Capability. Capable of operating and maintaining one of a group of diesel, diesel-electric, or steam powered, 18- to 24-inch cutterhead, pipeline dredges on a round-the-clock, 7 day per week basis. Must be augmented by one mess team CA and one mess team CB from the TOE 29–500 series. A typical 24-inch diesel powered, self-propelled, dredge of this class has the following physical and operational characteristics:

Length ----------270 ft, 0 in
Beam ---------- 38 ft, 0 in
Maximum draft ---------- 5 ft, 10 in
Dredge pump ---------- 1 each diesel powered, 24 in discharge.
Twin screws, diesel powered, 750 HP per shaft
Dredging depth:
Maximum ----------62 ft
Minimum ----------12 ft
Cutterhead ladder w/26 in suction line
Vertical clearance ----------61 ft, 6 in
Spuds (2 each) ----------92 ft long

c. Basis of Allocation. Normally assigned to an engineer brigade or logistical command.

d. Category. III

e. Mobility. 100 percent mobile afloat, when dredge is self-propelled or provided with a towing vessel.

f. Strength. Aggregate—68, as follows:

Number	*Grade*	*MOS*
1	LTC	0820
1	MAJ	0823
1	MAJ	0820
1	CPT	0823
1	CPT	0820
5	WO	562A
2	WO	561A
2	E–7(NCO)	61B40
1	E–5(NCO)	51F40
3	E–5	62F30
1	E–5	44E20
2	E–5	52E20
3	E–5	62E20
4	E–4	52E20
9	E–4	61B20
1	E–4	71H20
1	E–4	61C30
1	E–4	44C30
1	E–4	71J20
4	E–4	51F20
1	E–4	44K20
1	E–4	91B30
2	E–4	61B30
13	E–3	61A10
1	E–3	71A10
4	E–3	51A10
1	E–2	51A10

g. Major Items of Equipment.

Weapons
Individual weapons only.
Vehicles
None
Other equipment
Barge, deck cargo, nonpropelled, steel, 130–T, 81 ft ----------2
Barge, deck cargo, nonpropelled, steel, 585–T, 120 ft ----------2
Boat, bridge erection, 27 ft long ----------1
Dredge, hydraulic, pipeline, cutterhead type, diesel engine powered ----------1
OR
Dredge, hydraulic, pipeline, cutterhead type, steam powered, oil burning ----------1
Surgical instrument and supply set individual ---1
Tractor, full tracked, medium DBP, w/angledozer ----------1

h. Method of Operation. This team is organized and operates the same as team JA (para 7–2*h*). However, the larger capacity dredge permits discharge pipeline lengths up to 5,000 feet.

7–4. Team JC, Dredge, Seagoing Hopper, 500–900 Cubic Yard (Diesel)

a. Mission. To provide personnel and equipment for dredging operations, using a 500-900 cubic yard seagoing hopper dredge.

b. Capability. Capable of operating and maintaining one of a group of diesel-electric powered, seagoing hopper dredges, varying in hopper capacity from 500 to 900 cubic yards of material, on a round-the-clock, seven day per week basis. Must be augmented by one mess team CA and two mess teams CB from the TOE 29–500 series. A typical 900 cubic yard dredge of this class has the following physical and operational characteristics.

Length ---------- 215 ft, 10 in
Beam ---------- 40 ft, 4 in
Dredge pump ---------- 1 each diesel powered (420HP), 20-inch discharge.
Twin screw, diesel-electric powered, 700 HP per shaft.
  Light ---------- 9 ft, 11 in
  Loaded ---------- 13 ft, 0 in
Drag arms (2 each) ---------- 18 in diam
Speed:
  Light ---------- 14.1 mph
  Loaded ---------- 13.1 mph
Dredging depth (maximum) ---------- 40 ft
Vertical clearance ---------- 71 ft, 6 in

c. Basis of Allocation. Normally assigned to an engineer brigade or logistical command.

d. Category. III

e. Mobility. 100 percent mobile afloat.

f. Strength. Aggregate—64, as follows:

Number	*Grade*	*MOS*
1	MAJ	0820
1	CPT	0823
1	CPT	0820
1	LT	2120
5	WO	562A
4	WO	561A
2	E–7(NCO)	61B40
1	E–6(NCO)	61C40
4	E–6(NCO)	61B40
1	E–5(NCO)	61B40
8	E–5	62F30
1	E–5	44E20
1	E–5	61C30
1	E–5	91B20
1	E–4	71H20
2	E–4	61C30
1	E–4	05C20
1	E–4	44C30
1	E–4	71J20
4	E–4	61B20
17	E–3	61A10
1	E–3	71A10
4	E–2	61A10

g. Major Items of Equipment.

Weapons
Individual weapons only.
Vehicles
Truck, cargo, ¾-T ---------- 1
Other equipment
Dredge, seagoing hopper, diesel-electric powered, Lyman class ---------- 1
Surgical instrument and supply set, individual --1

h. Method of Operation. Team is organized into four departments; command, engine room, deck, and electrical. The command department is responsible for all vessel operations and ship's administration. The engine room department operates, maintains, and repairs the ship's power plant. The deck department is responsible for all deck operations and for the maintenance and upkeep of the vessel (less engine room equipment). The electrical department operates, maintains, and repairs the electric-powered marine equipment. This department operates under the supervision of the chief engineer who is the head of the engine room department. The team is provided with a ¾-ton truck as organic equipment for supply and administrative runs when the ship is docked.

7–5. Team JD, Dredge, Seagoing Hopper, 1,600–3,500 Cubic Yard (Diesel or Steam)

a. Mission. To provide personnel and equipment for dredging operations, using a 1,600–3,500 cubic yard seagoing hopper dredge.

b. Capability. Capable of operating and maintaining one of a group of diesel-electric or steam powered, seagoing hopper dredges varying in capacity from 1,600–3,500 cubic yards of material, on a round-the clock, seven day per week basis. Must be augmented by one mess team CA and three mess teams CB from the TOE 29–500 series. A typical 3500 cubic yard,

steam powered dredge of this class has the following physical and operational characteristics:

Length	351 ft, 9 in
Beam	60 ft
Dredge pump	2 each, 28 inch discharge.
Dredge pump motor	2 each, 1,150 hp
Twin screw, steam turbine powered, 3,000 hp per shaft.	
Draft:	
Light	21 ft, 3 in
Loaded	24 ft, 3 in
Drag arms (2 each)	30 in diam
Speed:	
Light	15.8 mph
Loaded	12.0 mph
Dredging depth (maximum)	50
Vertical clearance	95 ft

c. Basis of Allocation. Normally assigned to an engineer brigade or logistical command.

d. Category. III

e. Mobility. 100 percent mobile afloat.

f. Strength. Aggregate—89, as follows:

Number	*Grade*	*MOS*
1	LTC	0820
1	MAJ	0823
1	MAJ	0820
1	CPT	0823
1	CPT	0820
1	LT	2120
1	LT	0820
9	WO	562A
3	WO	561A
3	E–7(NCO)	61B40
1	E–6(NCO)	61C40
5	E–6(NCO)	61B40
2	E–5(NCO)	61B40
1	E–5	91B20
8	E–5	62F30
1	E–5	44E20
2	E–5	52E20
1	E–5	61C30
5	E–4	52E20
1	E–4	05C20
1	E–4	71H20
2	E–4	61C30
1	E–4	44C30
1	E–4	71J20
5	E–4	61B20
18	E–3	61A10
1	E–3	71A10
11	E–2	61A10

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Truck, cargo, ¾-T ---- 1

Other equipment

Dredge seagoing hopper, diesel-electric powered type DE–14 ---- 1

OR

Dredge seagoing hopper, steam type oil burning, 1600–3500 cu yd, Langfitt, Gerig, Biddle, or Comber class ---- 1

h. Method of Operation. This team is organized and operates the same as team JC (para 7–4*h*).

7–6. Team JE Dredge, Seagoing Hopper, 6,000–8, 100 Cubic Yard (Steam)

a. Mission. To provide personnel and equipment for dredging operations, using a 6,000–8,100 cubic yard seagoing hopper dredge.

b. Capability. Capable of operating and maintaining one of a group of steam-powered, seagoing hopper dredges, varying in capacity from 6,000-8,100 cubic yards of material, on a round-the-clock, seven day per week basis. Must be augmented by one mess team CA and three mess teams CB from the TOE 29–500 series. A typical dredge of this group, with a hopper capacity of 8,100 cubic yards, has the following physical and operational characteristics:

Length	525 ft, 2 in
Beam	72 ft
Dredge pump	2 each, 32 inch discharge
Dredge pump motor	2 each, 1,850 HP
Twin screw, steam turbine powered, 4,000 hp, per shaft	
Draft:	
Light	20 ft, 6 in
Loaded	30 ft, 7 in
Drag arms (2 each)	36 in diam
Speed:	
Light	17.3 mph
Loaded	16.6 mph
Dredging depth (maximum)	60 ft
Vertical clearance	140 ft

c. Basis of Allocation. Normally assigned to an engineer brigade or logistical command.

d. Category. III

e. Mobility. 100 percent mobile afloat.

f. Strength. Aggregate—98, as follows:

Number	*Grade*	*MOS*
1	COL	0820
1	LTC	0823

Number	*Grade*	*MOS*
1	LTC	0820
1	MAJ	0823
1	MAJ	0820
1	CPT	0820
1	LT	2120
3	LT	0820
9	WO	562A
3	E–7(NCO)	61B40
1	E–6(NCO)	61C40
5	E–6(NCO)	61B40
2	E–5(NCO)	61B40
1	E–5	91B20
10	E–5	62F30
1	E–5	44E20
4	E–5	52E20
1	E–5	61C30
1	E–4	05C20
9	E–4	52E20
1	E–4	71H20
2	E–4	61C30
1	E–4	44C30
1	E–4	71J20
1	E–4	44K20
6	E–4	61B20
17	E–3	61A10
1	E–3	71A10
11	E–2	61A10

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Truck, cargo, ¾-T ---------- 1

Other equipment

Dredge, seagoing hopper, steam powered, oil burning, 6,000–8,100 cu yard, Goethals, Essayons, or equivalent class ---------- 1

h. Method of Operation. This team is organized and operates the same as team JC para 7–4 *h*).

CHAPTER 8

ENGINEER CIVIC ACTION TEAMS, TOE 5–560

8–1. Introduction

a. General. TOE 5–560 consists of three teams whose mission is to provide specialized personnel and equipment for engineer military civic action operations.

b. Personnel Qualifications. In addition to possessing the requisite skills and knowledge of their respective MOS's, personnel of these teams may be parachute qualified when the team is assigned, attached, or designated for assignment or attachment to an airborne force, a special action force, or a joint unconventional warfare task force, and when such qualification is authorized by Department of the Army. It is advisable that officer personnel of these teams be cross-trained as civil affairs officers.

c. References. Information on military civic action is contained in FM 41–5, FM 41–10, TM 5–277, and the 31-series field manuals.

8–2. Team KA, Engineer Civic Action Headquarters

a. Mission. To provide personnel and equipment for an engineer headquarters and staff for the special action forces command and control element, and for MAAG, Missions, and Military Assistance Command Headquarters.

b. Capability. Capable of providing staff planning, coordination, and administrative support for up to three engineer civic action control teams (DB). May operate as the engineer staff section of a military assistance advisory group or a special forces operational detachment.

c. Basis of Allocation. One per two or three engineer civic action control teams (KB).

d. Category. III

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—10, as follows:

Number	*Grade*	*MOS*
1	LTC	7010
1	MAJ	7020
1	WO	621A
1	E–9(NCO)	51H50
1	E–8(NCO)	51H50
1	E–6(NCO)	67C40
1	E–5	71H20
1	E–4	71B30
1	E–4	81B20
1	E–4	76C20

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Trailer, cargo, ¼-T ---------- 1
Trailer, cargo, ¾-T ---------- 1
Truck, cargo, ¾-T ---------- 1
Truck, utility, ¼-T ---------- 1

Other equipment

Book set, construction group ---------- 1
Drafting and duplicating equipment set ---------- 1
Sketching set, survey, military field sketch ---------- 1

h. Method of Operation. This team serves as a headquarters exercising administrative and technical control over two or three engineer civic action control teams (KB). Personnel of the team serve as technical consultants on problems relating to construction, maintenance, and operation of public works and utilities.

8–3. Team KB, Engineer Civic Action Control

a. Mission. To provide personnel and equipment for the engineer staff of a special action forces command and control element, and of a MAAG, Mission, or Military Assistance Command.

b. Capability. Capable of providing staff planning, coordination, and administrative support for up to nine subordinate engineer civic action advisory teams (KC), and for other engineer cellular teams employed in civic action operations.

c. Basis of Allocation. One per four to nine engineer civic action advisory teams (KC).

d. Category. III

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—5, as follows.

Number	*Grade*	*MOS*
1	MAJ	7010
1	CPT	7020
1	E–8(NCO)	51H5H
1	E–4	71B30
1	E–4	81B20

g. Major Items of Equipment.

Weapons

Individual weapons only.

Vehicles

Truck, cargo, ¾-T ----------1
Truck, utility, ¼-T ----------1

Other equipment

Drafting and duplicating equipment set ----------1
Generator set, 3KW ----------1
Tool outfit, pioneer portable electric tools ----------1

h. Method of Operation. The team controls assigned engineer civic action advisory teams which are engaged in assisting indigenous military engineer units and staffs. It may also control other engineer teams assigned or attached for employment in military civic action projects.

8–4. Team KC, Engineer Civic Action Advisory

a. Mission. To provide personnel and equipment to serve as an advisor unit for host country engineer forces.

b. Capability. Capable of providing—

(1) Advice and assistance to host country engineer forces on civic action projects such as farm-to-market roads, bridges, village wells, and sanitation measures, and construction of schools, hospitals, and other public buildings.

(2) Assistance to host country engineer units in preparing to support their own tactical troops for internal defense and internal development operations.

(3) Advice and assistance to US Military Forces when committed in support of host country forces.

(4) Supervision of operations with host country counterparts.

c. Basis of Allocation. One per host country force comparable in size to a U.S. Army engineer combat battalion or per municipal area for civic action as required.

d. Category. III

e. Mobility. 100 percent

f. Strength. Aggregate—5, as follow:

Number	*Grade*	*MOS*
1	CPT	87900
1	E–7(NCO)	51H4H
1	E–7(NCO)	62B4H
1	E–6(NCO)	62B4H
1	E–6(NCO)	51H4H

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Trailer, cargo, ¾-T ----------1
Truck, cargo, ¾-T ----------1

Other equipment

Saw, chain, 18 inch ----------1
Tool kit, automotive mechanic's ----------2
Tool kit, carpenter's, engineer squad ----------1
Tool kit, pioneer, engineer squad ----------1

h. Method of Operation. The team advises, trains, and assists host country engineer units and their staffs in developing plans for and executing civic action projects in conjunction with the overall civil affairs program. Maximum utilization is made of local means of transportation, materials, and equipment. Projects are selected which are necessary and within the capabilities of host country personnel.

CHAPTER 9

ENGINEER COMBAT SUPPORT TEAMS, TOE 5–570

9–1. Introduction

a. General. TOE 5–570 consists of three teams of various sizes and types, whose mission is to provide specialized personnel and equipment to furnish military units (including those of friendly non–nuclear powers) with an atomic demolition munitions (ADM) capability, or to augment this capability in units that have it.

b. References. Information on the employment of ADM is contained in FM 5–26.

9–2. Team MA, Atomic Demolition Munitions Platoon Headquarters, Separate

a. Mission. To provide personnel and equipment for command and control of an ADM platoon consisting of up to six ADM squads (Team MC).

b. Capability. Capable of—

(1) Providing the supported unit with technical liaison, advisory, and limited planning services for the employment of ADM.

(2) Commanding subordinate teams in the execution of ADM missions.

(3) Coordinating the supply and resupply of ADM.

c. Basis of Allocation. One per two to six ADM squads (Team MC).

d. Category. I

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—5, as follows:

Number	*Grade*	*MOS*
1	LT	1331
1	E–7(NCO)	12B4N
1	E–3	70A10
1	E–3	12A10
1	E–3	05B20

g. Major Items of Equipment.

Weapons

Individual weapons, and
Launcher, grenade, 40 mm ---------- 1

Vehicles

Trailer, cargo, ¼-T ---------- 1
Trailer, cargo 1½-T ---------- 1
Truck, cargo, 2½-T ---------- 1
Truck, utility, ¼-T ---------- 1

Other equipment

Antenna, modified ground plane type, 20 to 389 mc frequency ---------- 1
Generator set, 1.5 KW ---------- 1
Boat, reconnaissance, pneumatic, 3-man ---------- 1
Power supply, PP2953/U ---------- 1
Radio set, AN/VRC–47 ---------- 1
Telephone set, TA–312/PT ---------- 1
Tool kit, pioneer, engineer squad ---------- 1

h. Method of Operation. The platoon leader commands the platoon and serves as a special advisor in ADM operations to the unit to which attached. When subordinate teams are deployed for specific ADM missions, he may, to insure adequate control, place part of the platoon under the command of the platoon sergeant, while he retains command of the remainder; he may also be required to conduct liaison between the deployed ADM teams and the supported headquarters, coordinating matters of ADM employment and associated matters of communications, supply, and security. When an ADM platoon is formed, the supported unit must augment the team with communications equipment, as necessary, to insure reliable communications between the supported unit and the team and between the team and its squads.

9–3. Team MB, Atomic Demolition Munitions, Liaison

a. Mission. To provide an ADM staff and liaison officer where required.

b. Capability. Capable of acting in the capacity of a special staff officer providing technical knowledge and advice for ADM employment

and providing liaison between the headquarters to which attached and other supporting or attached ADM teams.

c. Basis of Allocation. One to a U.S. or allied unit with an ADM mission and not otherwise authorized an ADM qualified officer.

d. Category. I.

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—2, as follows:

Number	*Grade*	*MOS*
1	CPT	51331
1	E–3	12A10

g. Major Items of Equipment.

Weapons

Individual weapons only

Vehicles

Trailer, cargo, ¼-T ----------1
Truck, utility, ¼-T ----------1

Other equipment

Radio set, AN/VRC–47 ----------1

h. Method of Operation. The officer assigned to this team operates as the ADM staff officer for the unit or headquarters to which he is attached. He provides technical knowledge, advice, and limited planning service in ADM matters. Necessary communications must be provided by the supported unit.

9–4. Team MC, Atomic Demolition Munitions Squad

a. Mission. To provide personnel and equipment for the execution of an ADM mission.

b. Capability. Capable of assembly, preparation for firing, and, when necessary, recovery, disassembly, or destruction of an emplaced ADM.

c. Basis of Allocation. One or more to provide a required ADM employment capability to an Engineer Combat Battalion (Army), U.S. Army units, task forces, or allied forces, and as required to increase the ADM capability of a divisional engineer battalion.

d. Category. I

e. Mobility. 100 percent mobile.

f. Strength. Aggregate—5, as follows:

Number	*Grade*	*MOS*
1	E–6(NCO)	12B4N
2	E–5	12B2N
2	E–4	12B2N

g. Major Items of Equipment.

Weapons

Individual weapons and,
Launcher, grenade, 40 mm ----------2

Vehicles

Trailer, cargo, 1½-T ----------1
*Truck, cargo, 2½-T ----------1

Other equipment

Antenna modified ground plane type, 20 to 389 mc frequency ----------1
Blasting machine, 50-cap capacity ----------1
Coder transmitter set, XM3 (Radio), XM4(wire) ----------2
Demolition set, explosive initiating, electric and non-electric ----------1
Radio set, AN/GRC–125 ----------1
Radio set, AN/PRC–25 ----------1
Reeling machine, cable, hand, manual operated ----------1
Splicing kit, telephone cable, MK/356/G ----------1
Telephone set, TA–312/PT ----------2
Tool kit, general use tools ----------2
Tool kit, special weapons support ----------1

* When support unit is equipped with tracked vehicles, team may be issued a full-tracked armored personnel carrier in lieu of the 2½ ton truck.

h. Method of Operation. Team is dependent on the unit to which attached for ADM storage and resupply, additional transport, security, site preparation, and team administration. When two or more of these teams are formed into a platoon, a Team MA provides the necessary command and control.

APPENDIX A

REFERENCES

A–1. DA Pamphlets

DA Pam 108–1	Index of Army Motion Pictures, Film Strips, Slides, and Recordings.
DA Pam in the 310–series	Pertinent to administration, training, and supply.
DA Pam 750–1	Maintenance Concepts.

A–2. Army Regulations

AR 27–20	Investigation and Processing of Claims.
AR 320–5	Dictionary of United States Army Terms.
AR 320–50	Authorized Abbreviations and Brevity Codes.
AR 380–5	Safeguarding Defense Information.
AR 380–55	Safeguarding Defense Information in Movement of Persons and Things.
AR 611–101	Manual of Commissioned Officer Military Occupational Specialties.
AR 611–112	Manual of Warrant Officer Military Occupational Specialties.
AR 611–201	Enlisted Military Occupational Specialties.
AR 750–1	Maintenance Concepts.
AR 750–8	Command Maintenance Management Inspections.

A–3. Field Manuals

FM 3–10	Employment of Chemical and Biological Agents.
FM 3–12	Operational Aspects of Radiological Defense.
FM 5–1	Engineer Troop Organization and Operations.
FM 5–15	Field Fortifications.
FM 5–20	Camouflage, Basic Principles and Field Camouflage.
FM 5–25	Explosives and Demolitions.
FM 5–26	Employment of Atomic Demolition Munitions (ADM).
FM 5–30	Engineer Intelligence.
FM 5–31	Use and Installation of Boobytraps.
FM 5–34	Engineer Field Data.
FM 5–35	Engineers' Reference and Logistical Data.
FM 5–36	Route Reconnaissance and Classification.
FM 5–135	Engineer Battalion, Armored, Mechanized and Infantry Divisions.
FM 5–136	Engineer Battalions, Airborne and Airmobile Divisions.
FM 5–144	Engineer Amphibious Units.
FM 5–146	Engineer Topographic Units.
FM 5–162	Engineer Construction and Construction-Support Units.
FM 20–32	Land Mine Warfare.
FM 20–33	Combat Flame Operations.
FM 21–5	Military Training Management.
FM 21–6	Techniques of Military Instruction.

FM 21–26	Map Reading
FM 21–30	Military Symbols.
FM 21–40	Chemical, Biological, and Nuclear Defense.
FM 21–41	Soldier's Handbook for Defense against Chemical and Biological Operations and Nuclear War.
FM 29–22	Maintenance Operations in the Field Army.
FM 30–10	Terrain Intelligence.
FM 31–	Series on Special Operations.
FM 41–5	Joint Manual for Civil Affairs.
FM 41–10	Civil Affairs Operations.
FM 100–5	Field Service Regulations; Operations.
FM 100–10	Field Service Regulations; Combat Service Support.
FM 101–5	Staff Officers' Field Manual; Staff Organization and Procedure.
FM 101–10–1	Staff Officers' Field Manual; Organizational, Technical, and Logistical Data, Unclassified Data.

A–4. Technical Manuals

TM 3–220	Chemical, Biological, and Radiological (CBR) Decontamination.
TM 5–225	Radiological and Disaster Recovery at Fixed Military Installations.
TM 5–227	Simplified Designs and Techniques for Military Civil Action.
TM 5–231	Mapping Functions of the Corps of Engineers.
TM 5–240	Map Compilation, Color Separation, and Revision.
TM 5–243	Cartographic Aerial Photography.
TM 5–244	Multiplex Mapping.
TM 5–245	Map Reproduction.
TM 5–297	Well Drilling Operations.
TM 5–300	Real Estate Operations in Overseas Commands.
TM 5–315	Fire Protection by Troop Organizations in Theaters of Operation.
TM 5–302	Construction in the Theater of Operations.
TM 5–330	Planning, Site Selection, and Design of Roads, Airfields, and Heliports in the Theater of Operations.
TM 5–331	Management; Utilization of Engineer Construction Equipment.
TM 5–332	Pits and Quarries
TM 5–337	Bituminous, Concrete, and Expedient Paving Operations.
TM 5–342	Logging and Sawmill Operation.
TM 5–343	Military Petroleum Pipeline Systems.
TM 5–351	Gas Generating.
TM 5–360	Port Construction and Rehabilitation.
TM 5–366	Planning and Design for Rapid Airfield Construction in the Theater of Operations.
TM 5–441	Topographic Surveying.
TM 5–545	Geology and Its Military Applications.
TM 5–600–series	Pertinent to Repairs and Utilities.
TM 5–700	Field Water Supply.
TM 5–765	Electric Power Transmission and Distribution.
TM 5–766	Electric Power Generation in the Field.
TM 9–237	Welding; Theory and Application.
TM 38–750	Army Equipment Record System and Procedures.
TM 55–375	Military Diving.

INDEX TO TEAMS

1. Alphabetic by team title.

Title	*Designation*	*Para*	*Page*
ADM Liaison	MB	9–3	9–1
ADM Platoon Headquarters, Separate	MA	9–2	9–1
ADM Squad	MC	9–4	9–2
Brush Fire Truck	FD	3–5	3–2
Carbon Dioxide Generating	GG	4–8	4–4
Civic Action Advisory	KC	8–4	8–2
Civic Action Control	KB	8–3	8–1
Civic Action Headquarters	KA	8–2	8–1
Company Headquarters	AC	2–3	2–1
Concrete Mixing and Paving	GI	4–10	4–5
Concrete Mixing and Paving	(Tentative)	10–2	---
Diving	HA	5–2	5–1
Dredge, Cutterhead, Pipeline, 12- to 16-in	JA	7–2	7–2
Dredge, Cutterhead, Pipeline, 18-to-24-in	JB	7–3	7–3
Dredge, Seagoing Hopper, 500–900 cu yd	JC	7–4	7–4
Dredge, Seagoing Hopper, 1600–3500 cu yd	JD	7–5	7–4
Dredge, Seagoing Hopper, 6000–8100 cu yd	JE	7–6	7–5
Firefighting Headquarters	FA	3–2	3–1
Fire Truck	FB	3–3	3–1
Floating Power Plant(Nuclear)	HI	5–11	5–7
Forestry	GA	4–2	4–1
Gas Generating	GF	4–7	4–3
Geodetic Survey	IE	6–6	6–4
Map Distribution Platoon	ID	6–5	6–3
Map Reproduction Platoon	IC	6–4	6–2
Military Hydrology	IL	6–11	6–7
Photographic Evaluation	IH	6–9	6–6
Photomapping Platoon	IB	6–3	6–1
Pipeline Design	HG	5–9	5–5
Platoon Headquarters, Separate	AB	2–2	2–1
Power Line	HE	5–7	5–5
Power Plant Operating and Maintenance	HF	5–8	5–5
Quarrying and Rock Processing	GH	4–9	4–4
Real Estate	HH	5–10	5–6
Survey	IA	6–2	6–1
Survey(Airborne)	IJ	6–10	6–7
Terrain	IF	6–7	6–4
Topographic Planning and Control	IG	6–8	6–5
Utilities(up to 2,500)	HC	5–4	5–2
Utilities(up to 4,000)	HD	5–5	5–2
Utilities(up to 10,000)	HJ	5–6	5–3
Water Distillation	GK	4–12	4–6

Title	Designation	Para	Page
Water Purification	GC	4–4	4–2
Water Purification (Central Plant)	GD	4–5	4–2
Water Transport	GE	4–6	4–3
Water Truck	FC	3–4	3–2
Welding	HB	5–3	5–1
Well Drilling	GB	4–3	4–2
Well Drilling(Airborne)	GJ	4–11	4–6

2. Alphabetic by team designation.

Designation	Title	Para	Page
AB	Platoon Headquarters, Separate	2–2	2–1
AC	Company Headquarters	2–3	2–1
FA	Firefighting Headquarters	3–2	3–1
FB	Fire Truck	3–3	3–1
FC	Water Truck	3–4	3–2
FD	Brush Fire Truck	3–5	3–2
GA	Forestry	4–2	4–1
GB	Well Drilling	4–3	4–2
GC	Water Purification	4–4	4–2
GD	Water Purification(Central Plant)	4–5	4–2
GE	Water Transport	4–6	4–3
GF	Gas Generating	4–7	4–3
GG	Carbon Dioxide Generating	4–8	4–4
GH	Quarrying and Rock Processing	4–9	4–4
GI	Concrete Mixing and Paving	4–10	4–5
GJ	Well Drilling(Airborne)	4–4	4–6
GK	Water Distillation	4–11	4–6
HA	Diving	5–2	5–1
HB	Welding	5–3	5–1
HC	Utilities (up to 2,500)	5–4	5–2
HD	Utilities (up to 4,000)	5–5	5–2
HE	Power Line	5–7	5–5
HF	Power Plant Operating and Maintenance	5–8	5–5
HG	Pipeline Design	5–9	5–5
HH	Real Estate	5–10	5–6
HI	Floating Power Plant(Nuclear)	5–11	5–7
HJ	Utilities (up to 10,000)	5–6	5–3
IA	Survey	6–2	6–1
IB	Photomapping Platoon	6–3	6–1
IC	Map Reproduction Platoon	6–4	6–2
ID	Map Distribution Platoon	6–5	6–3
IE	Geodetic Survey	6–6	6–4
IF	Terrain	6–7	6–4
IG	Topographic Planning and Control	6–8	6–5
IH	Survey (Airborne)	6–9	6–6
IJ	Survey (Airborne)	6–10	6–7
IL	Military Hydrology	6–11	6–7
JA	Dredge, Cutterhead, Pipeline, 12 to 16 in	7–2	7–2
JB	Dredge, Cutterhead, Pipeline, 18 to 24 in	7–3	7–3
JC	Dredge, Seagoing Hopper, 500–900 cu yd	7–4	7–4

Designation	Title	Para	Page
JD	Dredge, Seagoing Hopper, 1600–3500 cu yd	7–5	7–4
JE	Dredge, Seagoing Hopper, 6000–8100 cu yd	7–6	7–5
KA	Civic Action Headquarters	8–2	8–1
KB	Civic Action Control	8–3	8–1
KC	Civic Action Advisory	8–4	8–2
MA	ADM Platoon Headquarters, Separate	9–2	9–1
MB	ADM, Liaison	9–3	9–1
MC	ADM Squad	9–4	9–2
(Tentative)	Concrete Mixing and Paving	10–2	---

By Order of the Secretaries of the Army:

HAROLD K. JOHNSON
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:
DCSPER (2)
ACSI (2)
DCSLOG (2)
DCSOPS (2)
ACSFOR (2)
CORC (2)
CRD (1)
CINFO (1)
TIG (1)
TJAG (1)
TPMG (1)
TSG (1)
OPO (1)
CofEngrs (3)
CofCh (1)
USAMB (2)
USACDC Agcy (2) except
USACDCEA (10)
USCONARC (10)
USAMC (15)
USACDC (10)
USACDCCAG (5)
USACDCCSG (5)
USACDCCSSG (5)
USACDCICAS (5)
USACDCINS (5)
ARADCOM (10)
ARADCOM Rgn (10)
OS Maj Comd (5)
LOGCOMD (5)
MDW (5)
Armies (25)
Corps (15)
Div (10)
Div Arty (10)
Engr Bde (5)
Engr Gp (5)
Engr Bn (8)
Engr Co (2)
Br Svc Sch (10) except USAES (50)
Joint Sch (5)
USATC (5)
USMA (5)
USACGSC (5)
MAAG (2)
Mil Msn (1)
Units org under fol TOE:
5–500 (2)
5–510 (2)
5–520 (2)
5–530 (2)
5–540 (2)
5–550 (2)
5–560 (2)
5–570 (2)

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: Units—same as Active Army except allowance is one copy to each unit.

For explanation of abbreviations used, see AR 320–50.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1967—305–502/6011A

PENTAGON LIBRARY
3000015583